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GEOGRAPHY

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BY

ALEXIS EVERETT FRYE

Former Superintendent of Schools of Cuba

AUTHOR OF "CHILD AND NATURE," "BROOKS AND BROOK BASINS," "PRIMARY GEOGRAPHY," "ELEMENTS OF GEOGRAPHY," "HOME AND SCHOOL ATLAS," "TEACHERS' MANUAL OF METHODS IN GEOGRAPHY," ETC.

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PREFACE.

Commerce. A geography that seeks to lay a broad basis for the study of nations must throw a strong search-light upon their commercial relations. Commerce and the related industries take a leading place in this book, — those of our own country being illustrated by twenty original maps (*pages* 130 *to* 141).

Physical Features. The intelligent study of a country's resources must be based on its physical features. For this reason the surface-forms and climate of the various parts of the world are fully treated in the text and pictures.

Order of Lessons. Most teachers using this book will doubtless present the lessons in the order in which they appear, yet those who wish to complete the study of the United States in detail, before giving a broad view of other lands, can readily turn from the early lessons on the natural regions of our country (*pages* 30 *to* 52) to the study of its people, its industries, its states, etc. (*pages* 123 *et seq.*).

Sizes of Type. The text which needs the most careful study is in large type. The descriptive matter in small type does not call for close study, but may be used for supplementary reading.

Illustrations. Nearly all the pictures in this book were engraved directly from photographs. To the selection and grouping of subjects for the photographs, the author has given fully as much time and care as to the text itself. The aim has been to present *characteristic* or *typical forms* that are educative.

Spelling of Geographic Names. This book follows the rulings of the *United States Board on Geographic Names*, — the highest authority in our country.

There has long been confusion in the usage of capital letters. This book adopts what seems to be the best modern usage and allows the capital in *specific names*, such as Rhine and Andes, but not in *class names*, such as river and plateau; thus *Rhine river*. The *United States Board* rules out the apostrophe from names of places *within the United States*.

Study and Reference Maps. Two series of maps are used in this book, — the one containing such details as are needed in connection with the text; the other being the most complete series of reference maps ever placed in any text-book. Special attention has been given to the modeling of the relief maps of the continents and of the United States. It is thought that for purposes of comparison the little *globe* maps will prove helpful.

Acknowledgments. William Morris Davis, Professor of Geology in Harvard University, has given valuable assistance in this work, — especially in the treatment of winds and elementary land-forms.

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ALEXIS E. FRYE.

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29.3

TABLE OF CONTENTS.

THE EARTH.

	PAGE
Introduction	1
Form and Size of the Earth	2
The Land and the Sea	2
Directions	3
Directions on the Earth	3
The World Ridge or Primary Highland	4
Continents or Grand Divisions	5
The Oceans	6
The Waste of the Land	6
Rainfall	7
Springs and Streams	7
Land Waste on the Way to the Sea	8
Work of the Winds	8
Snow and Ice	9
Rivers and River Systems	10
River Basins and Divides	11
Young and Old Lands	11
Flood Plains and Deltas	12
Coastal Plains and Lake Plains	13
Mountains	14
Volcanoes	15
Waves	17
Shore Forms	17
Belts of Heat	18
Changes of Season	18
The Zones of Light	19
Seasons of the Heat Belts	20
Latitude and Longitude	22
Winds and Rainfall	22
Winds and Rains of Winter and Summer	24
Ocean Currents	25
The Moon and the Tides	26

NORTH AMERICA.

	PAGE
North America	27
The Rocky Mountains	30
The Sierra Nevada	32
The Cascade Range	33
The Great Basin	33
The Colorado Plateaus	37
The Columbia Plateau	38
The Coast Range and Valleys	38
The Yukon Region	
Highland of Mexico	40
Central America	41
The Appalachian Highland	41
Old Appalachian Range and Piedmont Belt	42
The Great Valley and Allegheny Ridges	43
The Allegheny Plateau	44
The Laurentian Highland	45
The St. Lawrence Basin	45
The Western Plains	47
The Prairies	48
The Northern Plain	49
Gulf Coastal Plain	50
Atlantic Coastal Plain	51

SOUTH AMERICA.

	PAGE
South America	53
The Southern Andes	56
The Middle Andes	56
The Northern Andes	57
The Highland of Brazil	58
The Guiana Highland	59
The Selvas	59
The Gran Chaco and the Pampas	60
The Llanos	61

ASIA.

	PAGE
Asia	63
The Altai Highland	64
Central Basin Region	64
The Highland of Tibet	65
Highlands of Southwest Asia	66
The Arctic and Caspian Slopes	67
The Pacific Slope	69

PAGE

India 70
Asiatic Islands 72

EUROPE.

Europe 75
Region of the Alps 76
The Spanish Peninsula 77
The Po and the Apennines 78
The Balkan Peninsula 80
The Plain of Hungary 80
The Scandinavian Peninsula 81
The British Isles 82
Low Europe 84–86

AFRICA.

Africa 87
Egypt and the Nile 89
Northern Africa and the Sahara Desert . . 91
Sudan 92
The Kongo Basin 93
Southern Africa 94

AUSTRALIA.

Australia 95
New Zealand and other Islands 97

RACES OF MEN.

Homes of the Races 99
The Negro or Black Race 100
The American or Red Race 101
The Malay or Brown Race 102
The Mongolian or Yellow Race 103
The Caucasian or White Race 104
Religions and Governments 105

PLANTS.

Where Plants Grow 107
Soil, Water and Heat 107
Plants of the Hot Belt 108
Plants of the Warm Belts 109
Plants of the Cool Belts 110
Plants of the Northern Cold Belt 111

ANIMALS.

Animals, — Their Habits and Uses 111
Animals and their Homes 111
South American Realm 113
Northern Realm 114

PAGE

African Realm 116
Oriental Realm 117
Australian Realm 118

COMMERCE.

Domestic and Foreign Commerce 119
Highways of Trade, — Water Routes 119
Railroads 121
Aids to Commerce 121
Time Belts and International Date Line . . 122

THE UNITED STATES.

Distribution of People 123
Government 124
Climate, — Temperature 127
Climate, — Winds and Rainfall 129
Cotton 130
Wheat and Indian Corn 131
Oats, Barley, Rye and Tobacco 132
Forests and Fruits 133–134
Horses, Mules and Hogs 134
Cattle, Dairy Products and Sheep 135
Fisheries 136
Coal and Iron 137–138
Petroleum and Natural Gas 139
Gold and Silver 140
Copper, Lead, Zinc and Building Stone . . . 141

GROUPS OF STATES.

New England States 142
Middle Atlantic States 144
Southern States 146–148
Central States 150–153
Southwestern States 154
Northwestern States 156

COUNTRIES AND COLONIES.

Canada and Newfoundland 158
Mexico, Central America, West Indies . . . 159
The British Isles 162
Countries of Low Europe, — Western Part . . 164
Mediterranean Countries 166
Other Countries of Europe 166
Countries of South America 168
Countries of Asia 170
Countries of Africa 173
States of Australia 175

INDEX TO TEXT.

NOTE. — *All figures refer to pages. Map pages are marked thus*, 173°; *picture pages are marked thus*, 16*. *Look first for pages in full face type* (**174**); *less important pages are in light face type* (173). *Lesson titles are in capitals* (AFRICA).

A

Abyssinia 173°, **174**.
Abyssinia, plateau **89**.
Acapulco **159**, 159°.
Aconcagua 55°, 56.
Acropolis 80*, 145°, **146**.
Adelaide **175**°.
Adige river 75°, 78.
Adirondack mts. 32°, **46**.
Adriatic sea 75°, 79.
Ægean sea 161°.
Afghanistan 171°, **172**.
AFRICA **87**, 88°, **173**°.
Climate 87.
Countries 173°.
Relief map 88°.
Surface 87.
AGE OF LAND 11, 12.
Aguas Calientes 159°.
Air 15; see also winds.
Akron **151**, 151°.
Alabama 138, 147°, **148**.
Alamo 149.
Alaska 29°, **39**, **40***, 123, 126, 137, **159**°.
Albany **145**°.
Alberta 159°.
Albuquerque **155**°.
Alexandria 173°, **174**.
Alhambra 78*.
Algeria 173°, **174**.
Algerian 91*.
Algiers 91, 173°, **174**.
ALLEGHENY PLATEAU 32°, 41, **44***, 136, 139.
ALLEGHENY RIDGES 32°, 41, **43**, 44, 138.
Allegheny 145°, **146**.
Alligators 59, 113*, 114*.
Alluvial fan **8***, 71.
Alpacas 57, 113*, 169.
Alpine lakes 78.
ALPS 75°, **76**, 77, 84.
ALTAI HIGHLAND **64**.
Amazon basin 55°, **59**, 168.
Amazon river 55°, 59.
Amazon vs. Kongo 94.
America 5°, 106.
American 104*, 149.
AMERICAN RACE **101**, 102.
Amsterdam 86, 165°, **166**.
Amur river 63°, 69, 117.
Anam **171**, 171°.
ANDES MTS. 53*, 55°, **56**, **57***, 113, 140, 169°.
Andorra 77, 106, 165°.
ANIMALS **111°–118**.
ANIMAL REALMS 111°.
African 116*.
Australian 118*.
Northern 114*.
Oriental 117*.
South American **113***.
Annual rainfall 129°.
Antarctic circle **20°**.
Antarctic ocean **6°**.
Ant-eater 113*.
Antelope 117.
Antwerp 86, **165**, 165°.
APENNINES 75°, 77, **78**, 79.
Apes 116, 117.
Apia 98, 175°.
APPALACHIAN HIGHLAND **35°**, **41**, 123, 137, 138, 144, 148, 151.
Apteryx 118*.
Arabia **67**, 104, 171°, **172**.
Arabian sea 66, 171°.
Arabs 91*, 105*.
Aral basin 92.
Aral sea 63°, 68, 69.
Archangel 161°, **167**.
Arctic circle 20°, 81.
Arctic ocean 6°.
ARCTIC SLOPE **49**, **67**.
AREAS of
Continents 178.
Countries 177.
Earth 27.
Lakes 179.
Oceans 178.
States 180.
Argentina **60**, **61**, 163, **168**, 169°.
Arica 169, 169°.
Arizona 126, 141, **155**°.
Arkansas **149**°.
Arkansas river 31, 32°.
Armadillo 113*.
Armor plate 139, 146, 163.
Artesian wells 109.
Art galleries 164, 165, 166.
Aryans **104**, 105.
Aryan type 104*.
ASIA **62°**, **63**, 117, 121, 139, **170**, 171°.
Climate 63, 64.
Countries **170**, 171°.
Relief map 62°.
Surface 62°, 63.
ASIA MINOR, see SOUTHWEST ASIA.
ASIATIC ISLANDS **72**, 171°, 175°.
Asiatic Turkey 171°, **172**.
Assiniboia 159°.
Assouan 90, 173°.
Asuncion **168**, 169°.
Atacama desert 55°, **57**, 169°.
Atbara river **89**°.
Athabasca 159°.
Athens 80, 165°, **166**.
Atlanta **147**°.
ATLANTIC COASTAL PLAIN 32°, **51**, **52**, 134, 147.
Atlantic fisheries 137.
Atlantic ocean 6°.
Atlas mts. 89°, 91*.
Attar of roses 80.
Auckland **175**°.
Augusta **147**°.
Auk 115*, 116.
Aurora 20.
Austin **149**, 149°.
AUSTRALIA 83, **95**, **96°**, 104, 105, 106, 118, 121, 136, 138, 140, 141, 162, 163, **175°**.
Climate 95.
Relief map 96°.
States 175°.
Surface 95.
Australian Alps 95, 97°.
Australians 95*, 97, 100*.
Austria-Hungary **81**, 165°, **166**.
Axis of earth 4, 18.
Azof 161°.
Azores 132*, W°.

B

Bad lands, Utah 32*.
Bahama islands 52, 118, 159°, **160**.
Bahia **168***, 169°.
Baku 106*, 171°, **172**.
Balearic islands 161°.
Bali 95, T°.
Balkan mts. 75°, 80.
BALKAN PEN. 75°, **80**.
Baltic sea 81, 85, 161°, 162, 167.
Baltimore 120, 131, 133, 136, 144, 145°, **146**.
Baluchistan 171°, **172**.
Bamboo **73***, 108*.
Banana 108*, 134, 160.
Banca 141, 175°.
Bangkok **171**°.
Bangor 133, **143**°.
Banks of Newfoundland **41**, 136, 158, 159°.
Bantu people 100.
Banyan 73*, 109*.
Barbados 159°, **160**.
Barcelona 161°, **166**.
Barley 56, 110, 132, 158.
Bar **16***, 17, 51, 52, 71.
Barre **143**°.
Barren lands 50.
Barrier reefs 98, 175°.
BASIN REGION OF ASIA 63°, **64**.
BASIN REGION OF U.S. 32°, 133, 154.
Basques 78.
Batavia 175°.
Bath 142*, 143°.
Baton Rouge 149°.
Batum 171°, **172**.
Bay City 151°, **152**.
Bay of Bengal 71, 171°.
Bay of Biscay 161°.
Bay of Fundy 159°.
Beaver 45*, 50, 114*, 115*.
Bedouin 91, 92*.
Belfast 84, **163**°.
Belgium **85**, 131, 138, **165°**, 167.
Belize 106, 159°.
BELTS OF HEAT **18°**.
Benares **171**°.
Ben-Nevis 75°, 82.
Benue river 89°, 93.
Berbers 91.
Bergen 161°, **167**.
Bering sea 29°, 116, 126°.
Bering strait 29°, 64, 69.
Berlin 86, **164***, 165°, 167.
Bethlehem 67*, U°.
Bighorn 114*.
Big Horn mts. 32°.
Big trees 32*.
Billiton 141, 175°.
Binghamton 145°.
Birmingham, Ala., 147°, **148**.
Birmingham, Eng., **163**°.
Bismarck 153°, **154**.
Bison 114*.
Black forest 85.
Black hills 32°, 48, 154.
Black mts. 43, F°.
BLACK RACE **100**, 105.
Black sea 76, 86, 161°, 167.
Blackstone river 143°, 144.
Bluefields 159°.
Blue Grass region 152.
Blue mts. 95, 97°.
Blue Nile **89**°.
Blue ridge 32°, 43.
Bluestone 141.
Boa 113*.
Boers 174.
Bogota 169°, **170**.
Boise **156**, 157°.
Bokhara 171°, **172**.
Bolan pass 63°, 66.
Bolivia 113, 140, **169°**.
Bolivia, plateau 55°, **56**.
Boma 173°, **174**.
Bombay 72, 170*, **171°**.
Boots and shoes 135, 142, 143, 156.
Bordeaux **165°**.
Bore or tidal wave 26*.
Borneo 72*, 73, 99*, 102, 117, **171**, 175°.
Bosphorus **80***, 165°.
Boston 42, 106, 119, 120, 121*, 130, 135, 136, **142***, 143°, 144, 175.
Bradford **163**°.
Brahmanists 102, 105.
Brahmaputra river, **63**, 65, 71, 170, 171°.
Brass 141, 144, 163.
Brazil **58**, **59***, 100, 113, 119, 144, **168**, 169°.
BRAZILIAN HIGHLAND 55°, 58.
Breadfruit 97, 108*.
Bridgeport 143°, **144**.
British Columbia **158**, 159°.
British Guiana 169°, **170**.
British possessions 78, 83, 106, 160, 172, 174.
BRITISH ISLES **82**, **83**, 97, 124, 131, 132, **162**, 163°. See also England, Great Britain, Ireland, Scotland, Wales.
British Museum 80.
Brockton **143**°.
Brooklyn 43*, 120, 131, **144**, 145°.
BROWN RACE **102°**, 105.
Brussels 85, 161°.
Budapest 165°, 167*.
Buddhists 102, 105, 172.
Buenos Aires 61, **168**, **169°**.
Buffalo 47, 120, **145°**.
Buffalo Bayou 149°.
Buffaloes 114, 115*–117*.
BUILDING STONE **141**.
Bulgaria 165°.
Burlington, Iowa **153°**.
Burlington, Vt. **142***, **143°**.
Burma 171°.
Bushmen 94.
Butte **156**, 157°.

C

Cabinet woods 60.
Cables, ocean 122, W°.
Cactus 38*.
Cairo 90, 172*, **173°**.
Calcutta 72, **170***, 171.
California 32°, **38**, **39**, 95, 124, 131, 134, 139, 140, 155°, **156**.
Callao 53*, **169°**.
Cambodia **171**°.
Cambridge, Eng. **163**.
Cambridge, U. S. **142**, 143°.
Camden 145°, **146**.
Camels 64, 67, 92, 112*, 115*, 116*.
Campos 59, 135.
Canada 83, 104, 106, 113, 131, 143, **158**, 159°, 162; see Laurentian highland and Northern plain.
CANALS 46*.
China 70.
Europe 167.
Holland 85.
Russia 86.
United States 121°.
Canary islands 173°, **174**.
Candia, or Crete 165°.
Cantabrian mts. 75°, 78.
Canton, China 68*, 171°, **172**.
Canton, Ohio **151°**.
Canyon of Colo. **37***, K°.
Cape Breton 159°.
Cape Cod 50, 137, 143°.
Cape Fear river 147°.
Cape Hatteras 137, 147°.
Cape Horn 55°, 56*, 124.
Cape of Good Hope 89°, 94, 121, 173°, **174**.
Cape Town 94, 173°.
Caracas 169°, **170**.
Caravans 64, 66, 93, 172.
Cardiff **163**°.
Caribbean sea 159°, 160.
Caribou 45, 50, 114*.
Carolina highland 32°, 43.
Caroline islands 98, 175°.
Carpathian; see Kar.
Carpets 136, 165, 172.
Carson City 155°, **156**.
Cascade mts. 32°, **33**.
Caspian sea 63°, **68**, **69**, 86, 92, 161°, 167.
CASPIAN SLOPES **67**.
Cassava 59, 93.
Cassiquiari river 55°, 61.
Castes 105.
CATTLE 48, 49, 59, 60, 61, 64, 68, 76, 79, 82, 86, 90, 113, 117, 118*, 132, **135°**, 142, 148–156, 158, 162, 166, 168, 174, 175.
Caucasus mts. 75°, **86**.
Caucasians 102, 104.
Cavern of Luray 43, 145°.
Cayenne 169°.
Celebes 73, **171**, 175°.
CENTRAL AMERICA **41**, 101, 113, **159°**, **160**.
CENTRAL STATES **150**, 151°, **153°**.
Cevennes 77, 165°.
Ceylon 72, 104*, 171°.
Chalk cliffs, Dover 84*.
Chamois 112*, 114, 115*.
Chamouni 8*.
Charcoal 137*, 138.
Charleston, S. C. 52, 130, **147°**.
Charleston, W. Va. 145°, **146**.
Charlotte **147°**.
Chattanooga 147°, **148**.
Chautauqua 145.
Cherokee nation **149°**.
Chesapeake bay **52**, 133, **136**, 145°, 146.
Cheviot hills 83, 163°.
Cheyenne **156**, 157°.
Chicago **46**, **49**, 119*, 121, 131–135, 138, 139, 144, 150*, **151°**.
Chicago river 150°.
Chickasaw nation 149°.
Chile **56**, **57**, 140, **169°**.
Chimborazo 55°, 58*, 79.
Chimpanzee 93, 116*.
China 63°, 64, **69**, **70**, 103, 109, 119, 144, 156, 162, **171°**, 172.
Chinese 70, 103*, 124.
Chinese empire 171°.
Chinook 129.
Choctaw nation 149°.
Christiania 81, 161°, **167**.
Christians 102, 105, 106*.
Cinchona 56*, 57.
Cincinnati **150***, 151°.
Cinnamon 72, 73*.
Civil day 122.
Cleveland **47**, 120, 139, **150***, 151°.
Cliff dwellings 37*.
CLIMATE of U. S. **127°**, **128°**, **129°**, **130**.
CLIMATIC MAPS,
Heat belts 21°.
Rainfall in U. S. 129°.
Temperature in U. S. 127°, 128°.
Winds 24°.
Seasons 21°.
Clocks 144, 166.
Cloves 73*.
COAL 44, 49, 83, 85, 86, **137°**, **138**, 145, 146, 148, 150, 157, 158, 163, 164, 165, 169.
COASTAL PLAINS **12***, **13***.
Africa 87.
Llanos 61.
Russia 86.
Siberia 67.
United States 32°, **50**, 51, 52.
COAST RANGE 32°, 38, 156.
Cochin China **171°**.
Cocoa 57*, 162, 168, 169.
Cocoanuts 72, 97*, 108*.
Codfish 136*, 137°, 158.
Coffee **59***, **67**, 73, 144, 145, 160, **168***, 172.
Coke 137*, 138.
Cold waves 50.
Colombia 58, 169°, **170**.
Colombo 171°.
Colon 159°.
Colorado 140, 141, **155°**.
Colorado canyon **37***, K°.
COLORADO PLATEAUS 32°, **37**, 38, 155.
Colorado river 31, 32°, 36, 37*.
Colorado Springs **155°**.
COLUMBIA PLATEAU 32°, **33**, **38**.
Columbia river 32°, **33**, **38**, **39**, **157°**.
Columbia, S. C. **147°**.
Columbus, Ga. **147°**.
Columbus, Ohio **151°**.
COMMERCE **119**, **121**.
Concord **143°**.
Condor 57*, 113*.
Connecticut 143°, **144**.
Connecticut river **11***, 133, 143°, 144.
Constantinople 80, 106, 165°, **166**.
Constitution of U. S. 124.
Consuls 121, 122.
Continental divide 31.
CONTINENTS **5**.
Copenhagen 165°, **166**.
COPPER 46, **141°**, 150, 155, 156, 163, 169.
Coral 2*, 52, 97, 98*, 148, T°.
Cordoba **168**, 169°.
Corinth, isthmus 75°, 80.
Cornwall 84, 141.
CORN 49, 56, 57, 83, 90, 93, 110, **131°**, **132**, 140, 146, 148, 149, 153, 154, 168, 175.
Costa Rica 159°.
Cotopaxi 55°, 58.
COTTON 43, 51*, 52, 59, 71, 76, 83, 90, 92, 93, 109*, 119, 124, **130°**, **132***, 140–149, 159, 163, 164, 166, 169, 172, 173.
Mills 130°, 143–148.
Cotton gin 124.
Cotton-seed oil 130, 149.
Covington 151°, **152**.
Coyote 48*.
Creek nation 149°.
Crete, or Candia 165°.
Crocodile 93, 116*, 117*.
Cuba 52, 106, 159°, **160**; see also Sup.
Currents of Indian O. 70.
Cutlery 138, 139, 163.
Cuzco **57**, 169°.
Cyclones 71.
Cypress swamp **43***.

D

Dairy 44, 76, **135***°, 143, 153, 165, 166.
Dakota farm 49*, 152*.
Dallas **149°**.
Damascus 171°, **172.**
Danube river 77, 80, 165°.
Dardanelles 165°.
Dates 66, 67, 109, 172.
Davenport **153°**.
Dayton 151°.
Dead sea 63°, 67*.
Death valley 32°, 36.
Deep sea **2, 3.**
Deer 112*, 114*, *115.
Dekkan 15, 63°, 71, **72.**
Delaware 123, 145°, **146.**
Delaware bay **52,** 145°.
Delaware river 43, 145°.
Delhi 68*, **171°.**
Delta plains **12.**
Brahmaputra 71.
China 69.
Colorado 36.
Danube 81.
Ganges 71, 117.
Mekong 70.
Mississippi 51.
Niger 93.
Nile 90.
Po 78, 79.
Rhine 85.
Rhone 77.
Yahtse, Alaska 13*.
Yellow 69.
Zambezi 94.
Denmark **81,** 82, 106, 161°, **166.**
Denver 31, 48, 154*, **155°.**
Deserts,
Atacama 57, 169°.
Gobi 63°, 64, 92.
Kalahari 87, 89°, 94.
Sahara 87, 90°, **91,** 92*.
Des Moines **153°**.
Detroit 47, 120, 150*, 151°, **152.**
Diamonds 94*, 166, 168.
Directions **3, 4°.**
Distributary 13.
District of Columbia **126,** 145°.
Divides **11.**
Continental 31.
India 71.
Rocky mts. 31.
South America 61.
Dnieper river 161°.
Dover, Del. 145°, **146.**
Dover strait 84*, 163°.
Dresden **164,** 165°.
Drowned valley **16***, 17*, 39, 45, 120.
Drumlin 10*, 49.
Dublin 162*, **163°.**
Dubuque **153°.**
Duluth 120, 153°, **154.**
Dundee **163°.**
Dunedin **175°.**
Dunes 9*, 33, 64, 91.
Dutch East Indies **171.**
Dutch Guiana 169°, **170.**
Dwarf willow 111*.
Dwina river 75°, 86.
Dyaks 72*, 73.
Dyewoods 60, 108.
Dykes 15, 85.

E

Earth **2.**
Area 27.
Axis 4, 18.
Orbit 18, 19*.
Revolves 18.
Rotates 3.
Earthquake 14, 15, 58, 76.
Earthquake wave 17.
East Indies 73, 108, 121, 133, **171.**
Eau Claire 151°, **152.**
Ebony 108.
Ebro river 75°, 78.
Eclipse 2.
Ecuador 57*, 59, **169°.**
Edinburgh 162*, **163°.**
Eddying storm **23°,** 129.
Eider duck 45*, 116, 115*.
Egypt **89,** 131, **173°.**
Egyptian 89*, 105*.
Elbe river 85, 164, 165°.
Elephant 70*, 71*, 89, 93, 116*, 117*.
Elevated railroad 120.
Elk 115*.
England 75°, **82, 83,** 119, 120, 130, 132, 135, 141, 144, **162, 163°;** see also British Isles and Great Britain.
English channel 163°.
Equatorial currents 25°.
Equatorial rains **23, 24°,** 58, 61, 87, 93, 95.
Erie 145°, **146.**
Erie canal 43*, 131, 145°.
Erminer 50, 115.
Eskimo 1, 20*, 50, 103*, 114*, 157.
Essequibo river 59, M°.
Euphrates river 63°, 66.
Eurasia **5°,** 68, 75, 103.
Europe **75,** 105, 106, 117, 121, 135, 139, 144, **161°, 165°.**
Canals 167.
Climate 75.
Countries 161°, 164°.
Relief map 74°.
Surface 75.
Evansville **151°.**

F

Falkland islands 169°.
Fall River **142, 143°.**
Fargo 153°, **154.**
Farm machines 149–153.
Fez 173°, **174.**
Figs 66*, 67, 109*.
Fiji islands 98, 102, *175°.
Fingal's cave 84*, 163°.
Finland 75°, 86.
Finns 103.
Fiord **17***, 81, 82*.
Fire temple 106*.
Firth of Clyde 163°.
Firth of Forth 163°.
Fisheries **136*, 137°.**
Flax 84, 110, 164, 167.
Flood plains **12,** 13*.
Amazon 59.
Ganges 71.
Mackenzie 50.
Mississippi 49*, 50, 51.
Nile 90.
Orinoco 61.
Rhine 85.
Florence 165°, **166.**
Florida 52, 118, 123, 134, 137, 147°, **148.**
Flour 49, 119, **131,** 133, 145, 146, 149, 150, 151, 152, 153, 154, 156, 172.
Forests 31, 32, 33, 38, 39, 43, 44, 46, 50, 52, 57, 59, 68, 80, 81, 85, 86, 87, 92, 93, 97, 110, 111, **133°,** 134, 142, 143, 145, 147, 150, 151, 154, 157, 158, 166. See also lumber.
Form of earth **2.**
Formosa 171°.
Fort Smith **149°.**
Fort Wayne **151°.**
Fort Worth **149°.**
Fossil shell 3*, 13.
France 77, 78, **84, 85, 86,** 104, 106, 119, 123, 130, 131, 136, 138, 140, 144, **164,** 165°, 171, 174.
Frankfort, Ky. 151°.
Frankfurt 164*.
Fraser river 33, 159°.
Freetown 173°, **174.**
French Guiana 169°, **170.**
French Indo-China 171.
Friendly islands 98, 175°.
Fruits 134°.
Fuchau 171°, **172.**
Furniture 133, 150, 152.
Fur seals **39*, 157.**
Fujiyama 72, 73*, R°.

G

Galapagos islands 169°.
Galveston 130, **149°.**
Ganges **71,** 117, 170, 171°.
Garonne river 165°, 167.
Geneva 165°, **166,** 167*.
Genoa 165°, **166.**
Georgetown 126, D°.
Georgia 123, 130, 137, 141, **147°.**
Geral mts. 55°.
Germany **85, 86,** 119, 124, 130, 131, 132, 135, 136, 138, 139, 140, 141, 144, **164,** 165°, 167, 174.
Geyser 30*, 31, 82.
Ghats, Western 63°, 72.
Giant's Causeway 75°, 84*.
Gibraltar 75°, 78.
Gila river 32°, **155°.**
Gilbert islands 98, 175°.
Giraffe 89, 116*.
Gironde river 85, 165°.
Glacial lakes **10,** 78, 86.
Glacier 9*, **10***, 76, 97.
Glasgow 83, **163°.**
Glass 44, 86, 146, 151, 164, 165, 172.
Gloucester **137,** 143°.
Gnu 116*, 117.
Gobi desert 63°, **64,** 92.
God 105.
Gold 31, **32,** 36, 72, 93, 97, 124, 135, **140°,** 141, 154, 155, 156, 162, 175.
Golden Gate 39*, 155°.
Gorilla 116*.
Gottenborg 167, N°.
Governments **105, 124.**
Grain **131°, 132°;** see also wheat, corn, etc.
Grain elevator 120*.
Grampian hills 163°.
Granada 78, N°.
Gran Chaco 55°, **60.**
Grand divisions **5°.**
Grand Manan 16*, 143°.
Grand Rapids 151°, **152.**
Granite **141,** 143.
Grapes 39, 79, 86, 109, 110*, 134°, 166.
Great Basin **32°, 33,** 65, 67, 140.
Great Britain 75°, , **82, 83, 84,** 97, 106, 119, 123, 131, 135, 136, 138, 139, 140, 144, 148, 160, 162, **163°,** 170, 172, 174; see British Isles, England, Ireland, Scotland, Wales.
Great Lakes **32°, 45, 46, 120,** 123, 133, 134, 137, 139, 150, 158.
Great Salt lake 32°, 36*.
Great Valley 32°, **43.**
Greece 80, 104, 165°, **166.**
Greenland 10*, 45, 82*, 106, 111*, 115, 125°.
Green mts. 30*, 32°, **42***.
Greenwich **22,** 163°.
Grindstones 141.
Guadalquivir river 75, 78.
Guam; see Sup.
Guatemala 159°.
Guayaquil **169°.**
Guiana **59,** 169°, **170.**
Guinea 173°.
Gum arabic 108*.
Gulf coastal plain **32°,** 43, 44, **50, 51,** 134.
Gulf of Bothnia 161°.
Gulf of California 125°.
Gulf of Finland 161°.
Gulf of Guayaquil 55°.
Gulf of Guinea 173°.
Gulf of Mexico 125°.
Gulf of St. Lawrence 125°.
Gulf stream **25,** 27, 52, 81, 128.
Guthrie **149°.**

H

Habana; see Havana.
Haiti 159°, **160.**
Hakodate R°.
Halibut 41, 136.
Halifax **158,** 159°.
Hamburg 86, **164,** 165°.
Hamilton **158,** 159°.
Hamites 93, 104, 105°.
Hanoi **171°.**
Harbors 17, 52, 120, 121.
Hardware 142, 144, 163.
Harrisburg **145°.**
Hartford 143°, **144.**
Hastings 75°, 84*, 163°.
Havana 52, 159°, 160*; see also Sup.
Haverhill **143°.**
Havre **165°.**
Hawaiian ids. 98*, 175°; see also Sup.
Heat belts **18°, 21°.**
Heat equator 21°, 23, **24.**
Hebrides 163°.
Helena **156,** 157°.
Hemispheres 4°, 5°, 120°.
Hemlock 135, 145.
Hemp 73, 110, 150, 152.
Hemp, Sisal 159.
Herat 171°.
Hides **135,** 149, 158, 168, 170, 174.
Highlanders 82, 83*.
Highways of Trade 119, U-V°.
Himalaya mts. 63°, 64*, **65***, 66, 70, 71, **92,** 114, 117.
Hindu Kush mts. 63°, 66.
Hindu religion 171.
Hindus 71*, 72, 99*, 104*.
Hippopotamus 116*.
Hoangho 63°, **69.**
Hobart 175°, **175.**
Hoboken 145°.
Hogs 49, 80, 114*, 132, **134°,** 150.
Holland **85*, 86, 165°.**
Holyoke **143°.**
Homes of races **99*.**
Honduras 159°.
Hongkong 70, **171°,** 172.
Honolulu 98*, 156.
Horses 60, 67, 68, 86, 92, 114, 117*, **134,** 152.
Hot spring 30*, 31.
Hot Springs **149°.**
Hot waves 50.
Houston **149°.**
Hudson bay 45, 50, 125°.
Hudson river 43*, 50, 131, 141.
Hudson valley 123, 144.
Hue **171°.**
Hugli river 170, 171°.
Humboldt river 32°, **36.**
Hungary **80,** 133, 164, 165°, **166,** 167.
Hydraulic mining 140*.

I

Iberian peninsula 77.
Ibex 114, 115*.
Ice and Snow 9.
Iceberg 9*, 10*.
Ice floe 20*.
Ice jam 50.
Iceland 82, 161°.
Ice sheet 10*, 42, **45,** 49, 81, 86.
Idaho 141, **156,** 157°.
Illinois 135, 138, 141, **151°.**
Immigrants 124.
Incas 57.
India **70, 71,** 83, 99*, 105, 106, 108, 109, 117, 131, 133, 140, 162, **170,** 171°.
Indiana 140, **151°.**
Indianapolis **151°.**
Indian ocean 6°.
Indians 41, 45, 50, 59, 60*, 99*, **101***, 113, 123, 132, 157, 158*, **179.**
Indian Territory, see Oklahoma.
India-rubber 60, 94, 108*.
Indigo 108*, 160, 162.
Indo-China 63°, **70, 171.**
Indus river 63°, 65, 71.
Inland climate 128.
International date line 120°, **122.**
Iowa 153°.
Iquique **169°.**
Iran plateau 66, 92.
Ireland 82*, 83*, **84***, **85***, 162*, **163°.**
Irkutsk 171°, **172.**
Iron 44, 46, 77, 81, 83, 85, 86, **138°***, **139,** 144, 145, 146, 148, 150*, 151, 152, 153, 160, 163, 172.
Iron gate **77***, 80.
Irrigation in
Altai highland 64.
Asiatic Russia 172.
California 39.
Chile 56*.
Euphrates 66.
Great Basin 36.
India 71.
Iran 66.
Nile valley 90.
Northern Africa 91.
Po valley 79.
Warm belts 109.
Western plains 31, 47, 48, 129.
Italy 75°, **78, 79,** 119, 124, 134, 162, 164, 165°, **166,** 174.
Itasca lake 153°.
Ivory 92, 93, 94, 104, 116, 172, 174.

J

Jackson **147°.**
Jacksonville 147°, **148.**
Jaguar 113*.
Jamaica 159°, **160.**
James river 43, 52, 145°.
Japan 68, **72, 73,** 106, 109, 114, 119, 140, 144, 156, 171°, **172.**
Japan current 40.
Japanese 73, 103*, 172.
Java 72*, 73, 102*, **171,** 175°.
Jersey City 120, 144, 145°, **146.**
Jerusalem 171°, **172.**
Jetties 39, **47***.
Jewelry 143, 146, 165.
Jews 102, 105*.
Jordan river 67.
Juneau **157,** B°.
Jura mts. 75°, 76°, **77.**

K

Kabul 171°, **172.**
Kadiak 126°.
Kaffirs 94*, 100*.
Kalahari 87, 89°, 94.
Kamchatka 171°.
Kamerun mts. 89°, 93.
Kangaroo 118*.
Kansas 131, 153°, **154.**
Kansas City, Kan. 48, 134, 135, 153°, **154.**
Kansas City, Mo. **153°.**
Karakoram mts. 63°, 65.
Karpathian 75°, 77.
Kashmir 65*, 66, **104***.
Keewatin 159°.
Kenia 89°, 93.
Kentucky 151°, **152.**
Kerosene 139.
Key West 147°, **148.**
Khaibar pass 63°, **66***.
Khelat 171°, **172.**
Khiva 171°, **172.**
Kilauea 98, 175°.
Kilimanjaro 89°, 93.
Kimberley **94***, 173°.
Kingston 159°, **160.**
Klondike **158,** B°.
Knoxville 147°, **148.**
Kong mts. 89°, **92.**
Kongo river 89, 93*, 95.
Kongo state **93,** 173°, **174.**
Kongo vs. Amazon 94.
Koran 105.
Korea 171°, **172.**
Kremlin 167*.
Kuenlun mts. 63°, 65.
Kuka 93, Q°.
Kyoto 171°, **172.**

L

Labrador **45,** 158, 159°.
Labrador current 128.
Lachine rapids 27*.
La Crosse 151°, **152.**
Ladrone islands 98, T°.
Lagoon 16*, 17, 51, 79, 97.
Lake plains **13***.
Caspian 69.
Hungary 80.
Kashmir 65*, 66.
Prairies 48.
Red river 48.
Lakes,
Baikal 67, 171°.
Champlain 43, 142, 143°.
Como 75°, 78.
Erie 134, 137, 145°.
Garda 75°, 78.
Geneva 75°, 76, 77.
George 42*, 43, 145°.
Huron 32°, 46.
Killarney 75°, 84.
Ladoga 161°.
Lucerne 76, 77*, O°.
Maggiore 75°, 98.
Michigan 32°, 137, 152.
Nicaragua 41, 159°.
Ontario 32°, 133, 137.
Superior 32°, 45, 67, 133, 138, 139, 150.
Tanganyika 89°, 93.
Tchad 89°, 91, 92.
Titicaca 55°, **56***, 57*.
Victoria **89°.**
Wenner 75°, 81.
Lake Superior region **46, 133°, 138°, 141°.**
Land and Sea **2.**
Landes 84, 85*.
Land hemisphere **4°.**
Land's End 84*.
Landslide 15, 65, 76.
Land waste **6, 8.**
Lansing 151°.
La Paz **169°.**
Lapland 75°, 81, 103*.
La Plata, see Plata.
La Plata valley, see Plata valley.
Laramie **156,** 157°.
Laramie plains 30, 32°.
Lassa 171°, **172.**
Latitude **22.**
Laurentian highland 29°, 42, **45,** 46, 81.
Lava plains **15***, 31*.
Columbia plateau 38.
Deccan 72.
Lawrence **142,** 143°.
Lead 141, 156.
Leadville **155°.**
Leaning tower 80*.
Leather 135, 142, 145, 146, 152, 165.
Leavenworth 153°, **154.**
Kashmir 65*, 66, **104***.
Keewatin 159°.
Kenia 89°, 93.
Kentucky 151°, **152.**
Kerosene 139.
Key West 147°, **148.**
Khaibar pass 63°, **66***.
Khelat 171°, **172.**
Khiva 171°, **172.**
Kilauea 98, 175°.
Kilimanjaro 89°, 93.
Kimberley **94***, 173°.
Kingston 159°, **160.**
Klondike **158,** B°.
Knoxville 147°, **148.**
Kong mts. 89°, **92.**
Kongo river 89, 93*, 95.
Kongo state **93,** 173°, **174.**
Kongo vs. Amazon 94.
Koran 105.
Korea 171°, **172.**
Kremlin 167*.
Kuenlun mts. 63°, 65.
Kuka 93, Q°.
Kyoto 171°, **172.**

Lebanon 63°, 65*, 67*.
Leeward islands 159°.
Leipzig **164**, 165°.
Lemon 39, 79, 109, 134°.
Lena river 63°, 68.
Lengths of rivers 178.
Leopard 116*.
Lesser Antilles 52, 159°.
Levees 51, 152*.
Lewiston **143°**.
Lexington 151°, **152**.
Liberia 173°, **174**.
Lichens 49, 50*, 111.
Lick Observatory 38, 39*.
Liege **165°**.
Lighthouses 119*, 121.
Lima 53*, **169°**.
Lime and limestone 141.
Lincoln 153°, **154**.
Linen 84, **110**, 163, 165.
Lion 116*.
Lisle **165°**.
Little Rock **149°**.
Liverpool 83, 120, **162***, **163°**.
Llama 57, 58, 113*.
LLANOS 55°, **61**, 135.
Lobster 112*, 136*, 137°.
Lochs 82.
Locomotives 139, 143.
Loire 165°, 167.
Lombok 95, T°.
London 83*, 120, 144, **162***, 163°.
Long Island 50, 143°.
Sound 143°, 144.
LONGITUDE **22**.
Longs peak, 31, 32°.
Lorelei 86*.
Los Angeles 155°, **156**.
Lotus 90*, 108*.
Louisiana **148**, 149°.
Louisville 133, 151°, **152**.
Lowell 130, **142**, 143°.
Lower California 33*, 159°.
Low EUROPE 80, **84**, **86**, 104.
LUMBER 55, **133°***, **134**, 143, 145, 147, 148, 150, 151, 152, 153, 155, 158, 162, 167; see also forests.
Lynchburg 145°, **146**.
Lynn **143°**.
Lyon 77, **165°**.
Lyre bird 118*.

M

Mackenzie river 29°, **50**. 68.
Mackerel 136*, 137°.
Macon **147**, 147°.
Madagascar 94, 102, 173°, **174**.
Madeira river 55°, 59.
Madison 151°.
Madras 72, 170*, **171°**.
Madrid 161°, **166**.
Maelstrom 81, N°.
Magdalena river 55°, 58.
Magellan strait 55°, 56.
Magnetic pole 3.
Mahogany 108.
Mails 122.
Maine 141, **143°**, 158.
Makassar 175°.
Malaga 161°, **166**.
Malay peninsula 141, 171°.
MALAY RACE 73, 102*°.
Mammoth cave 43, 151°.
Managua 159°.
Manchester, N. H. 142*, **143°**.
Manchester, Eng. **163°**.
Manchester canal **163°**.
Manchuria 171°.
Mandalay **171°**.
Manila 175°; see Sup.
Manitoba 158, 159°.
Manufacturing **130°**, 131, 133, 134, 135, **136°**, **138°**, 139, 142, 144, 147, 150, 163, 165.
Maori chief 102*.
Map drawing **178°**.
MAPS; see climatic, political, production, relief.
Marathon 75°, 77*, 80.
Marble 141, 143.
Marseille **165°**, 166*.
Marshall islands 98, 175°.
Marthas Vineyard 137, 143°.
Maryland 123, 145°, **146**.
Maskat 171°, **172**.
Massachusetts 123, 135, 137, 141, **142**, 143°.
Mauna Loa 98, 175°.
Meat **134°**, **135°**, **136°**.
MEDITERRANEAN COUNTRIES 165°, **166**.
Mediterranean sea 118, 161°.
Mekka 171°, **172**.
Mekong river 63°, 70.
Melbourne 174*, **175°**.
Memphis 51, 147°, **148**.
Mercury freezes 128.
Meriden 143°, **144**.
Meridian 147°, **148**.
Meridian of Greenwich 22, 163°.
Merrimac river **143°**.
Mersey river 83, **163°**.
Mesa 37*.
Mexicans 41*, 104*, 149.
Mexico, city, 41, **159°**.
Mexico, country, 30, **40**, 57, 101, 123, 137, 140, **159°**. I°.
Miami valley 49*, I°.
Michigan 141, 151°, **152**.
Micronesia 98, 175°.
MIDDLE ATLANTIC STATES **144**, 145°.
Middle basin 63°, **64**, 92.
Middle park 30, 32°.
Milan 79, 165°, **166**.
Military academy 145.
Millet 70, 71.
Millinery 165.
Milwaukee 47, 120, 151°, **152**.
Minneapolis 49, 131, 133, 152*, **153°**, 154.
Minnehaha falls 27*.
Minnesota **153°**, 154.
Mississippi 147°, **148**.
Mississippi river 31, 32°, 47, **51**, 119, 150, 154.
Mississippi vs. Nile 90.
Missouri 141, **153°**.
Mitchells peak 32°, **43**.
Mobile 146*, 147°, **148**.
Mocha 171°, **172**.
Modeling **178°**.
Mohammedans 102, **105**, 166, 172.
Mohave desert 32°, 36, 154*, 155°.
Mohawk valley 43*, 123, 134, 144, 145°.
Monaco 78*, O°.
Monarchy 105.
Mongolia 171°.
MONGOLIAN RACE 102°, **103**.
Monkey 113*, 117*.
Monrovia 173°, **174**.
Monsoons **24°**, 70.
Montana 140, 141, 155, **156**, 157°.
Mont Blanc 75°, 76*, 77.
Montenegro 165°.
Montevideo 61*, **168**, 169°.
Montgomery 147°, **148**.
Montpelier **143°**.
Montreal 46, **158***, 159°.
MOON AND TIDES **26***.
Moors 77, 78*, 91, 105*.
Moose 45, 114*.
Moraine **10**, 49, 86.
Morocco 173°, **174**.
Moscow 86* 161°, **167***.
Mosque 106*.
Mosses 50*.
Moultrie, fort 146*.
MOUNTAINS **14***.
Fold 44*.
Heights 179.
Mt. Ararat 63°, 67.
Mt. Blanc, 75°, 76*, 77.
Mt. Cenis tunnel 75°, 79.
Mt. Elburz 75°, 86.
Mt. Etna 75°, 79.
Mt. Everest 63°, 65*.
Mt. Hamilton 38°, K°.
Mt. Hekla 75°, 82.
Mt. Hood 30*, 32°, 33.
Mt. Kenia 89°, 93.
Mt. Kilima-Njaro 89°, 93.
Mt. Logan 40, 93, 126°.
Mt. Mansfield 42*, 143°.
Mt. Mitchell 32°, 42*, 43.
Mt. Rainier 32°.
Mt. San Francisco 32°.
Mt. Shasta 32°, **33***.
Mt. St. Elias 40*, 126°.
Mt. Washington 42, 143°.
Mt. Whitney 32°, **32**.
Mulberry 73, 77, 79, 109.
MULES **134**.
Munich **164**, 165°.
Murray river 95, 97°.
Musk deer 65.
Muskegon 151°, **152**.
Music boxes 166.

N

Nanling mts. 63°, 69.
Nantucket 143°.
Naples 79, 165°, **166**.
Narragansett bay 143°.
Nashville 147°, **148**.
Nassau 159°, 160.
Natchez 147°, **148**.
Natural bridge 42*, 43.
NATURAL GAS **139**, 140, 144, 150.
Naval academy 146.
Navy yards 142, 143, 145, 146, 148, 156.
Nebraska 153°, **154**.
Negritos 73.
NEGRO RACE 41, 90, 92, 93, 94, 99*, **100**, 102°, 124, 160, **180**.
Negro river 59, 89°.
Nelson river 29°, 50.
Netherlands; see Holland.
Nevada 140, 155°, **155**.
New Albany **151°**.
Newark 145°, **146**.
New Brunswick 158, 159°.
NEW ENGLAND **42**, 119, 130, 133, 135, 136, **142**, 143°.
New England highland 32°, **42**, 141.
Newfoundland 41, **158**, 159°.
Banks 136, 159°.
New Guatemala 159°.
New Guinea; see Papua.
New Hampshire 123, **143**, 143°.
New Haven 143°, **144**.
New Jersey 123, 137, 145°, **146**.
New Mexico 126, **155°**.
New Orleans 51, 119, 130, 147, **148**, 149°.
Newport, R. I., 143°, **144**.
Newport, Ky. 151°, **152**.
New South Wales **175°**.
New York bay 52.
New York city 43*, 83, 120, 131, 132, 133, 135, **144**, 145°, 146, 147, 148, 155, 165.
New York, port 120.
New York state 123, 133, 135, 136, 139, 141, **144**, 145°.
NEW ZEALAND **97**, 118, 136, **175°**.
Niagara falls 46*, 145°.
Nicaragua 41, 159°.
Nicaragua canal 41.
Niger river 89°, 92, 93.
NILE RIVER **89°**, **90**, 116, 174.
Nile vs. Mississippi 90.
Niter 169.
Norfolk 130, 145°, **146**.
Norsemen 81.
NORTH AMERICA **27**, 28°, 125°, 158, 159°.
Climate 53, 127°–129°.
Countries 123, 125°, 158, 159°.
Relief maps 28°, 32°, 34–35°.
Surface 27–52.
North cape 81*, 161°.
North Carolina 123, **147°**.
North Dakota 153°, **154**.
NORTHERN AFRICA **91**.
Northern lights 20.
NORTHERN PLAIN 29°, **49**, 50.
North park 30, 32°.
North sea 85, 161°.
North star 3, 18.
NORTHWESTERN STATES **156**, 157°.
Northwest Territory 158, 159°.
Norway **81***, 161°, **167**.
Nova Scotia 158, 159°.
Nubia 173°.

O

Oahu 98, 175°.
Oakland 155°, **156**.
Oasis 91, 92*.
Oats 110, 132°.
Ob river 63°, 68.
OCEAN CURRENTS **25**, 25°.
Ocean routes 120°, 121.
OCEANS **6°**.
Oder river 85, 165°, 167.
Odessa 86, 161°, **167**.
Ogden **155**, 155°.
Ohio 138, 139, 140, 141, 145, **150**, **151°**.
Ohio river 44, 50, 133, 134, 137, 150, 151°.
Oil; see petroleum.
Oil-cake 130, 149.
Okhotsk sea 63°, 64.
Oklahoma 101, 126, **149°**.
OLD APPALACHIAN RANGE **41**, **42**, 43.
Olive 67, 79, 109, 162.
Omaha 153°, **154**.
Oman 171°, **172**.
Ontario **158**, 159°.
Opium poppy 108*, 172.
Oporto 166, N°.
Orange river 89°, 94.
Oranges 38*, 39, 52, 78, 79, 109, **134°**.
Orang-outan 117*.
Orbits 18, 19*, 26*.
Orchard fruits 110, 134°.
Oregon **156**, 157°.
Orinoco river 55°, **61**, 113, 170.
Orizaba 40.
Orkney islands 163°.
Ornithorhynchus 118*.
Osaka **172**, S°.
Oshkosh 151°, **152**.
Ostrich 93, 94, 116*.
Ottawa **158**, 159°.
Otters 50, 115.
Ottoman Empire **166**, 173, 174.
Oxford **163°**.
Oyster 118, 136*, 137°.
Ozark highland, 32°, 44.

P

Pacific fisheries 137°.
Pacific islands 97, 102, 118, 175°, V°.
Pacific ocean 6°, V°.
Pagans 102, **105**.
Pagoda 106*.
Palms 60*, 108.
Palm oil 93, 94, 174.
Pamir plateaus 63°, 66.
PAMPAS 55°, **60**, 113.
Panama **53**, 55*°, 58, 124, 159°, 160.
Paper 143, 172.
PAPUA, see New Guinea.
Para 60, 144, **168**, 169°.
Paraguay **168**, 169°.
Paraguay river 55°, 61.
Paraffin 139.
Parallels 22°.
Parana river 55°, 60.
Paris 164*, **165°**, 167.
Parkersburg **145°**, 146.
Parliament 160*, 162.
Parrot 113*, 118*.
Parsees 104*.
Parthenon 80.
Passes of Alps 79*.
Patagonia 57, 60.
Paterson 145°, **146**.
Pawtucket 143°, **144**.
Peaches 52, 134°.
Pearls 118, 172.
Peat 84.
Peccary 113*, 114*.
Pecos 32°, 48*.
Peking 171°, **172**.
Pennsylvania 123, 135, 136, 138, 139, 140, **145°**, 146.
Penobscot river 133, 143°.
Pensacola 147°, **148**.
Pepper 73*.
People in U. S. **123**, 124°.
Peoria 151°, **152**.
Pernambuco 58*, **168**, 169°.
Persia 66, 171°, **172**.
Persian gulf 63°, 66.
Peru **57**, 101, 113, 140, **169°**.
Peruvian bark 56*, 168.
Petersburg 145°, **146**.
PETROLEUM 44, 86, 115, **139°***, 140, 144*, 146, 150, 164, 172.
Philadelphia 120, 123, 124, 135, 136, 138, 139, 144, **145°**, 146.
Phosphate 147.
Philippine islands **73**, **171**; see also Sup.
PIEDMONT BELT **32°**, 41, **42**, 43, 133.
Pierre 153°, **154**.
Pikes peak 31, 32°.
Pindus mts. 80.
Pisa 80, O°.
Pittsburg 44, 138, 139, 145°, **146**, 151.
Plain of China 63°, 69.
PLAIN OF HUNGARY **80**.
PLANT BELTS **107-111**.
Plata river **168**, 169°.
Plata valley 55°, 58, 60, 113, 136.
PLATEAUS,
Abyssinia **89°**.
Bolivia **55°**, 56, 57.
Mexico 29°, **40**.
Tibet 63°, **65**.
Pnum Penh **171**, 171°.
Po river 75°, 77, **78**, 79.
Polar currents 25°, 45.
Pole, magnetic **3**, 125°.
POLITICAL MAPS,
Africa 173, Q°.
Alaska 126, B°.
Arctic regions X°.
Asia 171, R°.
Australia 175, T°.
British Isles 163, P°.
Canada 159, L°.
Central Africa X°.
Central America 159.
Central Europe 165, O°.
Central States 151, I°, 153, H°.
Europe 161, N°.
Greece, Ancient U°.
Historical X°.
Italy, Ancient U°.
Mexico 159, L°.
Middle States 145, E°.
New England 143, D°.
No. America 125, A°.
Northwestern States 157, K°.
Palestine, Ancient U°.
So. America 169, M°.
Southeast Asia S°.
Southern States 147, **F°**, 149, G°.
Southwestern States 155, J°.
United States 126, B°.
West Indies 159.
World, commerce V°.
Pompeii 79*, U°.
Popocatepetl 29, 40, 41*, 159°.
POPULATION **99–104**.
Center 124°.
Cities 124°, 177, 181.
Countries 177.
States 180.
United States 124°.
World 99, 102, 178.
Porcelain 103, 164.
Pork **134°**, **135**, 142.
Port au Prince 159°, **160**.
Portland, Me. **143**, 143°.
Portland, Ore. 39, 156*, **157°**.
Porto Rico 159°, **160**; see also Sup.
Port Said 87, 90*, 173°.
Portsmouth **143°**.
Portugal 77, 104, 161°, **166**, 171, 174.
Potomac river 43, 145°.
Potosi **169°**.
Pottery 144*, **146**, 168*.
PRAIRIES 32°, **48**, 49*, 114, 119, **123**, **131**, **132**, **133**, **135**, 136
Pribilof islands 39*, 40, 116, 126°, 157, B°.
PRIMARY HIGHLAND **4**, 5
Prince Edward I. 158, 159°.
PRODUCTION MAPS **130-141**.
Cattle 135.
Coal 137.
Copper **141**.
Corn 131.
Cotton 130.
Dairying **135**.
Fisheries 136.
Forests 133.
Fruits 134°.
Gold 140.
Hogs 134.
Iron 138.
Oats 132.
Petroleum 139.
Sheep 135.
Silver 140.
Tobacco 132.
Wheat 131.
PRONOUNCING VOCABULARY **182**.
Providence **143°**.
Pueblo **101***, **155°**.
Puget sound 39, **157°**.
Puma 113, 114*.
Puno 56*, 57, 169°.
Pyramid 89*, 90, 173°.
Pyrenees mts. 77, 161°.

Q

Quagga 116*, 117.
Quebec **158***, 159°.
Queensland **175°**.
Quicksilver 32, 38.
Quincy, Ill. 151°, **152**.
Quinine 57, see Peruvian bark.
Quito 55°, **57**, **169**, 169°.

R

RACES OF MEN **99–104**, 102°.
Racine 151°, **152**.
RAILROADS 119, **121°**.
Time Belts **122°**.
Rails 138, 139, 146, 163.

RAINFALL **23°**, **24°**, **129°**.
Raised maps; see relief.
Raisins 80, 134.
Raleigh **147°**.
Rangoon **171°**.
Reading 145°, **146**.
RED RACE **101**, 102°.
Red river 32°, 148, 149°.
Red river prairies 48, 50, 154, 158.
Red sea 67, 118, 171°, **172**.
Redwood forests 38.
Reindeer 50, 68, 81, 115*:
Reindeer moss 50*, 68.
RELIEF MAPS,
Africa 88.
Asia 62.
Australia 96.
Europe 74.
North America 29.
Primary highland 5.
South America 54.
United States 32, 34.
World ridge 5.
Races 102.
Animal realms 111.
RELIGIONS **105**.
Republics 106.
Reservations 101, **179**.
Revolution of earth 18.
Rhine river 75°, 76, 85, 86*, 165°, 167.
Rhinoceros 116*, 117*.
Rhode Island 123, **143°**,
Rhone river 75°, 76, 77, 165°, 167.
Rice 51, 52*, 71, 73, 90, 147, 148, 171, 172.
Richmond 52, 133, 145°, **146**.
Riga 161°, 167.
Rio de Janeiro 58, **168***, 169°.
Rio Grande 30, 31, 32°, 47*, 50, 113, 155.
Rio Negro 55°, 61.
RIVERS **10**, **11**, **178**.
Rochester 49, **145°**.
ROCKY MTS. **30**, **31**, **32°**, 39, 76, 124, **140**.
Rome 79, 80, 165° 166*.
Rosin 52, 147.
Rotation of earth 3.
Rotterdam 164*, 165°, **166**.
Roumania 165°.
Roumelia 165°.
Routes of Trade **119**, **120°**, 121°, V–W°.
Rubber **60**, 142, 144, 160, 162, 168, 169, 174.
Russia 64, 85*, **86**, 106, 119, 124, 131, 132, 133, 136, 161°, **167**.
Russian Empire 167, 171°, **172**.
Russian oil 139, see Baku.
Russians 104*, 157.
Rutland, **143**, 143°.
Rye 110, 132.

S

Sable 114*, 115.
Sacramento 155°, **156**.
Sagebrush 31*, 47, 110*.
Saginaw 151°, **152**.
Saginaw bay 151°, 152.
SAHARA DESERT 9*, 87, **91***, 92*, 93, 104, 114, 173°, 174.
Saigon **171**, 171°.
St. Albans **143**, 143°.
St. Bernard pass 79*.
St. Gotthard 75°, 76*, 79.
St. Helena 85, 173°.
St. John **158**, 159°.
St. Johns **158**, 159°.
St. Joseph 153°, **153**.
ST. LAWRENCE BASIN 32°, **43**, **45**.
St. Lawrence river **45**, **46**, 120, 123, 143, 158, 159°.
St. Louis 131, 132, 133, 146, 148, 152*, **153°**.
St. Mark's 167*.
St. Marys strait **46***, 151°.
St. Paul 153°, **154**.
St. Peter's 166.
St. Petersburg 86, 161°, **167**.
Salem, Ore. **157**, 157°.
Salmon 39, 45, 67, 136*, 137°, 157.
Salt 86, 145, 146, 152.
Salt desert 66, R°.
Salt Lake City 36, 154*, **155°**.
Salvador 159°.
Samoa 97*, 98*, 175°.
San Antonio **149°**.
Sand bars **16***, 17.
Sandstone 141.
Sandwich ids., see Hawaiian ids. 175.
Sangay 58.
San Francisco 38, 39*, 98, 120, 124, 131, 141, 155°, **156**, 160.
San Francisco river 55°, 58.
San Jose 159°.
San Juan 159°, **160**.
San Luis park 30, 32°.
San Marino 75°, 79, 80*, 106.
San Salvador 159°.
Santiago 168*, **169°**.
Santiago, see Sup.
Santa Fé **155°**.
Santo Domingo **160**.
Santos **168**, M°.
Saone river 75°, 77.
Sardinia 165°.
Saskatchewan 159°.
Savannah 52, 130, **147°**.
SCANDINAVIAN PENINSULA **75°**, **81**.
Scotland **82**, 83*, 104*, **163**, 163°.
Scranton 145°, **146**.
SEA-BOTTOM **2**, **13**.
Sea of Azof 161°.
Sea of Galilee 67; see Lake Gennesaret U°.
Sea islands 130.
Seal **39***, 40, 67, 68, 81, 112*, 114*.
Seaports 120.
SEASONS **18**, 19, 20, 21°.
Seattle **157**, 157°.
Seine river 26*, 165°.
SELVAS 53, 55°, **59**, 113.
Semites 102°, 104, 105*.
Senate 123*, 125.
Seoul 171°, **172**.
Servia 165°.
Shanghai 70, 171°, **172**.
Shannon river 84*, 163°.
Sheep 60, 61, 64, 68, 82, 86, 90, 94, 97, 113, 114*, 118*, 135, **136°**, 145, 148, 154, 155, 156, 158, 166, 168, 169, 174, 175.
Sheffield **163°**.
Shetland islands 163°.
Shipbuilding 142*, 144*, 145, 146, 163, 150.
SHORE FORMS **16***, 17.
Shoshone falls 38*, K°.
Shreveport **148**, 149°.
Siberia **67**, **68**, 103, 140, 167, 171°, **172**.
Siberian railroad 172, R°.
Sicily 79, 165°.
Sierra Leone 173°, **174**.
Sierra Madre 29°, 159.
SIERRA NEVADA **32°**, 124, 136, 155.
Silk 68*, **70**, 73, 76, 77, 79, 103, 109, 146, 156, 159, 162–6, 172.
Silver 31, 36, 57, 124, 135, **140°**, 141, 155, 156, 169.
Simoon 91.
Singapore 72*, **141**, 171°.
Sioux City 153°, **153**.
Sioux Falls 153°, **154**.
Sisal hemp 159.
Sitka **157**, 159°.
Slate 141*.
Slaves 100, 101, 124.
Smelting 138, 155, 156.
Smyrna 171°, **172**.
Snake river 31, 32°, 38.
SNOW AND ICE **9**, 22*.
Snow-line 56, 58.
SOIL AND PLANTS **107**.
"Soo" canal 46*.
South Africa 140, 173°.
South African Rep, 173°.
SOUTH AMERICA **53**, 101, 113, 168, 169°.
Climate 53.
Countries **168**, 169°.
Relief map 54°.
Surface 53.
South Australia **175°**.
South Bend **151°**.
South Carolina 123, 130, **147**, 147°.
South Dakota 140, 153°, **154**.
South park 30, 32°.
South Sea islanders 98.
SOUTHERN PLAIN **50**, 83, 90, 100, 119, 124.
SOUTHERN STATES **146**, 147°, **148**, 149°.
SOUTHWESTERN STATES **154**, 155°.
SOUTHWEST ASIA 66, **67**, 171°.
Spain **77**, **78**, 104, 106, 123, 141, 160, 161°, 162, **166**, 171, 174.
Spaniards 57, 73, 78*, 123, 134, 160.
Sphinx 89*, 90.
Spices 73*, 162, 165.
Spitzbergen 8*, W°.
Spokane **157°**.
Sponges 2*, 118, 137°, 148, 160*.
Springfield, Ill. 151°, **152**.
Springfield, Mass. **143°**.
Springfield, Mo. **153°**.
Springfield, Ohio **151°**.
Staffa 84*, 163°.
Staked plain 32°, **48***.
Standard time 122°.
Stanford University 154*, 155°.
Stanovoi mts. 63°, 68.
Steamships 83, 119*, 138.
Steel, see iron.
Steppes 63°, 68*, 86, 89, 114, 119, 136.
Stockholm 81, 161°, **167**.
Storms 16*, 23°.
Strait of Dover 163°.
Strait of Gibraltar 75°, **78**.
Strait of Magellan 55°, 56.
Straits Settlements S°.
Sucre **169**, 169°.
SUDAN **92**, 93, 99*, 100*, 104, 173°, 174.
Suez canal 87, 90*, 121, 140, 171, 173°, 174.
Sugar 51*, 59, 73, 80, 86, 90, 93, 98*, 109, 119, 144, 148, 156, 159, 160, 162, 164, 165, 166, 168–170, 172.
Sugar beets 80, 86, 164, 165, 166.
Suliman mts. 63°, 66.
Sumatra 73, 99*, 102, 141, 165, **171**, 175°.
Sun 2, 18.
Supreme Court 125.
Susquehanna river 43, 145°.
Sweden **81**, 161°, **167**.
Sweet potato 109.
Swiss plateau 75°, **76**.
Switzerland 106, 119, 165°, **166**.
Sydney 174*, **175°**.
Syracuse 49, **145°**.

T

Table mountain 94.
Tabriz 171°, **172**.
Tacoma **157°**.
Tahlequah **149**.
Tallahassee 147°.
Tanning 135, 145, **146**.
Tapioca 59.
Tapir 113*, 117*.
Tashkend 171°, **172**.
Tasmania 97°, **175°**.
Tea 1*, 70, 73, 109, 114, 156, 162, 165, 172.
Teak 72, 171.
Teheran 171°, **172**.
Tehuantepec 158°.
Telegraph 122.
Telephone 122.
TEMPERATURE **127°**.
Tennessee river 43, 126°.
Tennessee 141, 147°, **148**.
Terni falls 76*, 79.
Territories 126.
Texas 119, 130, 134, 135, 136, **148**, 149°.
Texas prairies 32°, 49, 148*, 149, 154.
Thames river 83, 163°.
Thermometers 128.
Thian Shan mts. 63°, 66.
Thirteen colonies 123.
Thousand Isles 145°, 158*.
Thunderstorms 129.
Tiber 79, 165°.
TIBET **65**, 66, 171°, **172**.
Tibetan 64*.
Tidal marsh 16*, 18.
TIDES **26***.
Tiflis 171°, **172**.
Tiger 70, 112*, 117.
Tigris river 66, 171°.
Timbuktu 93, 173°.
TIME BELTS **122**.
Tin 84, **141**, 144, 175.
Titicaca, lake 56*, **57***.
Tobacco 43, 52, 73, 80, 109*, 124, **132°**, **133**, 144, 146, 147, 148, 150, 152, 153, 159, 160, 164–166, 168.
Tokyo 171°, **172**.
Toledo **151°**.
Tonga 98*, 99*; see Friendly ids. 175°.
Topeka 153°, **154**.
Toronto **158**, 159°
Torrid zone 19, 20°.
Toucan 113*.
Tower of London 83*.
TRADE HIGHWAYS **119**.
Trading stations 94.
Trade winds **23°**, **24°**.
Trans-Caucasia 171°, **172**.
Transvaal, or So. African Rep. 173°, **174**.
Tree ferns 60, 68*, 95*.
Trenton 144, 145°, **146**.
Tribal government 105.
Trieste 165°, **167**.
Trinidad 159°.
Tripoli 166, 173°, **174**.
Tropics 19, 20°.
Tsetse fly 116*, 117.
Tundras 49, 63°, **68**, 86, 111*.
Tunis 173°, **174**.
Tunnels **76**.
Turkey 80, 106, 165°, **166**, 172.
Turkestan 171°, 172.
Turpentine 52, 146*, 147.
Turtles 97, 118.
Twilight 3.
Two-ocean pond 31.

U

UNITED STATES,
Area 123.
Boundary 123.
Chinese 124.
Cities **142–157**, 181.
Climate **127°–129°**.
Commerce 119, 120, 121, **130–141**, 160, 163–165, 172, 174.
Government **124**.
Indians **101**, **179**.
Negroes **100**, **180**.
Number 125.
People **104**, **123**, 124.
Population **180**, **181**.
Products **130°–141°**.
Rainfall **129°**.
Relief maps **32°**, **34°**.
States **142** to **157**, **180**.
Surface **30** to **52**.
Temperature **128°**.
Winds **23°**, **24°**, **129°**.
Ural mts. 68, 86, 161°.
Ural river 161°.
Uruguay 168°, **169**.
Utah **155°**.

V

Valdai hills 75°, 86.
Valencia, Sp. 161°, **166**.
Valencia, Ven. 169°, **170**.
Valparaiso 56, **169°**.
Vancouver island 159°.
Vapor 7.
Vatican 80, 166.
Vegetables 52, 147, 155.
Venezuela 169°, **170**.
Venice 79*, 165°, **166***.
Vera Cruz 40, **159°**, 160.
Vermont 141, **143°**.
Vesuvius 15*, **79***.
Vicksburg 51, 147°, **148**.
Victoria, Aus. **175**.
Victoria, B. C. **158***, 159°.
Victoria falls 94.
Victoria Nyanza **89°**.
Vienna 81, 165°, **167**.
Vineyards 39*, 78, 79, 86, 165.
Virginia 123, 145°, **146**.
Virginia, city 155°, **156**.
Vistula river 85, 165°.
Viti-Levu 98, T°.
Vladivostok 171°, **172**.
VOCABULARY **182**.
Volcanic islands 97.
VOLCANOES **15***, 56, 57, 58, 72, **79**, 82, 98.
Volga river 85*, **86**.

W

Wales 82, **83**, 163°.
Wallace's line 95.
Walrus 114*, 116.
Wasatch mts. 31, 32°.
Washington, city **126°**.
Washington, state **157°**.
WASTE OF LAND **6**.
Watches 76, 144, 166.
WATER AND PLANTS **107**.
Waterbury 143°, **144**.
Water hemisphere 4°.
Waterloo 85*, 165°.
Water parting 11.
WATER ROUTES **119**.
Waterspout 8*, 9.
Waves 3*, 9, 17.
Weather Bureau 129.
Weathering 6, 7*.
Welland canal 46.
Wellington **175°**.
Westerly winds **23°–25**.
Western Australia **175°**.
Western Ghats 63°, 72.
Western plains 31, 32°, **47**, 48, 124, 133, 135, 154.
West Indies 52, 113, 133, 134, 144, **159°**, **160**; see also Sup.
West Point 43*, **145°**.
West Virginia 139, 145°, 146.
Whaleback 120*, 150*.
Whalebone 115.
Wheat 38, 49, 56, 66, 67, 71, 78, 80, 83, 90, 94, 110, **131°**, **132**, 140, 144, 149, 153, 154, 156, 157, 162, 167–169, 174, 175.
Wheeling 145°, **146**.
Whirlwinds 9.
White mts. 32°, 42*, 42.
White Nile 89.
WHITE RACE 102°, **104**.
White sea 161°, 167.
Wichita 153°, **154**.
Willamette valley 32°, **39**, 156, 157.
Wilmington, Del. 145°, **146**.
Wilmington, N. C. **147**.
WINDS 8, **22**, **23°**, **24°**.
Wind River mts. 31, 32°.
Windward islands 159°.
Wine 78, 134, 162, 164, 165, 166.
Winnipeg **158**, 159°.
Winona 153°, **154**.
Winston 147°.
Wisconsin 151°, **152**.
Wool 44, 82, 94, **135**, **136°**, 142, 149, 150, 157, 158, 162, 164, 167, 168, 174, 175.
Woolen cloth **135**, **136°**, 142, 163, 165.
Woolly elephants 68.
Woonsocket 143°, **144**.
Worcester **142**, 143°.
WORLD RIDGE **4**, **5°**.
Wyoming **156**, 157°.

Y

Yablonoi mts. 63°, 64.
Yak 64*, 65, 114, 115*.
Yale University 144.
Yam 93.
Yangtze river 63°, 69.
Yarkand 171°, **172**.
Yazoo river 32°, 51.
Yellow pine 147, 148.
YELLOW RACE 102°, **103**.
Yellow river **69**; see Hoangho 171°.
Yellowstone park 30*, 31, 32°, 114, 156.
Yenisei river 63°, 68.
Yokohama 73, 170°, 171°, **172**.
Yosemite valley 32°, 33*.
Youngstown **151°**.
Yucatan **159°**.
Yucca 38*, 154*.
YUKON RIVER REGION **39**.

Z

Zambezi river 89°, 94.
Zebra 116*, 117.
Zebu 71*, 117*.
Zinc 141.
ZONES **19**, 20°.
Zuni 101*, 154*.
Zurich 165°, **166**, 167*.

THE EARTH.

Introduction.

See *Teachers' Manual of Methods in Geography.*

THIS book describes the earth as our home.

We ought to know a great deal about the earth, because we live on it and use many of its products.

The earth supplies us with food, clothing and all other useful things. Do you not wish to know where wheat and corn grow? — where grassy plains are covered with cattle, horses and sheep? — where fields are white with cotton or blue with flax? — where trees are cut down, floated to the mills and sawed into lumber? — where coal, iron ore and granite are taken out of the earth?

All these products, and many more, are found in various parts of the United States, our own country, but some of the things which we use are raised by people in other lands. From this book we are to learn what kind of country those people live in, how they dress, what work they do, what they buy of us and what they sell to us.

We shall also learn why the same kinds of products are not found in all parts of the earth. Our study will lead us to the cold land of the Lapps, where the sun shines low in the sky for several weeks each summer without setting. In that region, the warm season is too short to ripen much grain, but the flesh, milk and skins of reindeer supply food and clothing.

In other cold parts of the earth, there are vast fields of ice and snow, upon which Eskimos hunt the seal or the polar bear. How different is their life from ours! They see no grain ripening in fields, no cattle grazing in pastures, no fruit hanging on trees.

This book describes wide regions of shifting sand, where no rain falls and no plants grow, except near a few springs. There the people travel mostly on the backs of camels.

Do you know how tea leaves are dried and how silk is woven into fine cloth? You will learn how, when you read about the yellow people in Japan and China.

There are warm lands where coffee berries and many kinds of spices grow. Do you not wish to learn about the people who send us coffee, cloves and nutmegs? Every day as we study this book and look at its pictures, we shall learn something about the earth, — its forms of land and water, its plants, its animals or its people.

Geography treats of the earth as the home of man.

1. Form and Size of the Earth.[1]

The earth is a great ball of land and water, surrounded by a shell of air.

We see so small a part of the earth at a time that it does not look like a ball, but there are many proofs that the earth is round. Here are a few of them:

America.

The Old World.

1. Many persons have gone around the earth.

2. As ships sail out to sea, their hulls are lost to sight while their sails are clearly seen.

3. When travelers go day after day towards the north or the south, new stars rise over the horizon before them, while the stars behind sink beneath the horizon.

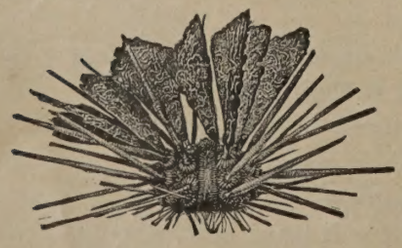
Coral — ½.

4. Sometimes the earth moves between the sun and the moon and casts a shadow on the moon. The edge of this shadow always looks like part of a circle.

The sun and the moon are round, like the earth. The moon is smaller than the earth, but the sun is many times larger.

The shadow of the earth on the moon is called an *eclipse of the moon*. There may also be an eclipse of the sun, when the moon is between the earth and the sun.

The great body of salt water which surrounds the land is called the *sea*. Various parts of the sea are known as *oceans*. The oceans lie in broad hollows on the earth.



Sea-Urchin — ½.

The two maps above show the land and the water on both sides of the earth.

The earth is so large that the distance from side to side, through the center, is nearly 8000 miles. The greatest distance around the earth is about 25,000 miles. Many millions of people live on the earth, and yet a large part of the land is not used.

If a train of cars were to travel day and night at the rate of thirty miles an hour, how long would it take to go 25,000 miles?

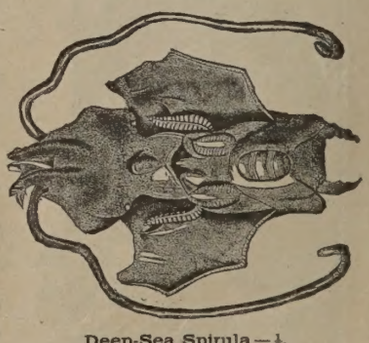
2. The Land and the Sea.

The greater part of the earth is a mass of rock. On the land most of the rock is covered with soil. Fine mud, or *ooze*, covers the rock under the sea.

Many parts of the land do not rise very high above the sea, but other parts are lofty and rugged. Some mountains rise higher than most of the clouds which we see, — even four or five miles into the air.

Most parts of the sea *near the land* are shallow. Far from the shores the sea is in many places two miles deep, and in some places the bottom is four or five miles below the surface.

The land and the surface of the sea have light by day and darkness by night. They have also warm and cold seasons. No sunshine reaches the deep parts of the sea. The deep water is therefore cold and dark.



Deep-Sea Spirula — ½.

The land has many valleys and mountains, but a large part of the sea-bottom is a great smooth plain.

The wind blows sand and dust over the land and also makes waves on the surface of the sea, but the deep sea is very still. Part of the rain falling on the land feeds brooks and rivers which carry or *wash* loose soil down the slopes and help to wear valleys in the land. Thus the form of the land is slowly changed.

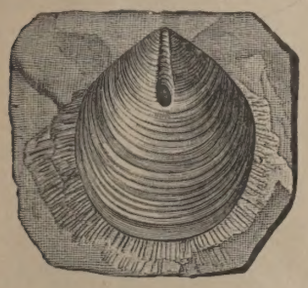
Sponge — ½.

Nearly all the soil which is washed into the sea settles in the shallow water near the shores. The smooth bottom of the deep sea hardly changes at all, for there are no streams to wear valleys in it, and very little soil from the land reaches these quiet waters.

[1] For pronunciation of difficult words, see the *Vocabulary* in the Supplement.

Animals and plants, or parts of them, are often buried in the layers of sand and mud which are formed in the sea. During long ages, many layers form and gradually harden to rock. The remains of animals or of plants bedded in the rock are called *fossils*.

Plants and animals of many kinds live on the land. Seaweeds, fish and other kinds of creatures abound in the shallow waters near the seashores, but the cold and dark depths of the sea have only a few kinds of plants and not nearly so many kinds of animals as live either in the shore waters or on the land.



A Fossil Shell.

The picture on page 136 shows a few of the many kinds of fish which are found along the shores of our country. Have you ever seen any fish like those?

Some of the small pictures on this page and that opposite show a deep-sea fish and a few other forms of deep-sea life.

We shall study the land more than the sea, because we live on the land and get from it most of the things we use.

3. Directions.

In our country all shadows cast by the sun at midday point due north. When you stand with your back to the midday sun, as seen from our land, you face the north. Your back is then towards the south.

Have you ever seen the *north star?* Do you know how to find it by means of the two stars called *pointers,* in the "Dipper"?

North is the direction along the earth's surface towards the north star. *South* is the opposite direction.

Which is the north side of your schoolroom? Which is the south side? Name some objects north of your schoolhouse. Name some objects south of it.

When you face the north, east is on the right side, and west is on the left.

When you face the south, which direction is on the right? Which is then on the left?

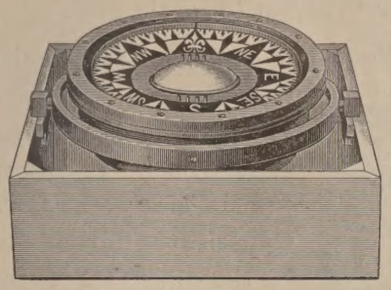
Only twice each year[1] the sun rises due east of us and sets due west, but it always rises in the *eastern* part of the sky and sets in the *western* part.

Name some objects east of your schoolhouse. What street near by runs about east and west?

Point midway between north and east. This direction is called *northeast* and may be written N. E. Where will you look for *southeast?* Where will you look for S.W.? For N.W.?

[1] About March 21 and September 22.

Here is the picture of a *mariner's compass.* Under its glass cover is a round card, naming the *points of the compass,* — N., S., E., W., N.E., S.E., etc. On the under side of the card is a steel magnet in the form of a needle or bar that swings on a pivot.



Mariner's Compass.

The needle generally points almost north and south.[1]

By means of the compass, the sun or the stars, sailors can at all times tell the direction in which they are moving. Without this simple magnet-needle, the task of steering vessels from port to port would be very difficult.

4. Directions on the Earth.

The earth is always turning round like a ball spinning as it flies through the air, but the earth turns only once in twenty-four hours, — a day and night.

The sun can light and warm only a little more than one half[2] of the earth at a time. As the earth turns, or *rotates*, some parts of it are turning into the sunlight while other parts are turning away from it. One side of the earth has day while the other side has night.

Deep-Sea Fish — ⅛.

As the earth rotates, its surface moves from west to east. The sun seems therefore to "rise" in the east and "set" in the west.

[1] The needle points to the *magnetic pole* of the earth. Find this pole on the map of North America, page 125.

Waves on the Seashore.

[2] If there were no air the sun would light very little more than half the earth at a time. There would then be no twilight, and the sun would not be visible after it had actually sunk beneath the horizon line.

Bright daylight would be tiresome, if it lasted all the time, with no dark hours for rest and sleep. The nighttime would be cold and dismal, if there were no sunshine to heat and light the earth.

Far away in the north, there is a point on the earth, known as the *north pole*. It is under the north star, which is often called the *pole star*. Opposite the north pole, on the other side of the earth, there is a point called the *south pole*.

Map A.

The word *pole* means *pivot*, or point on which a thing turns. The earth does not rest on anything, but turns in space *as if* held by a line running from pole to pole. We can *think* of such a line, and we will call it the *axis* of the earth.

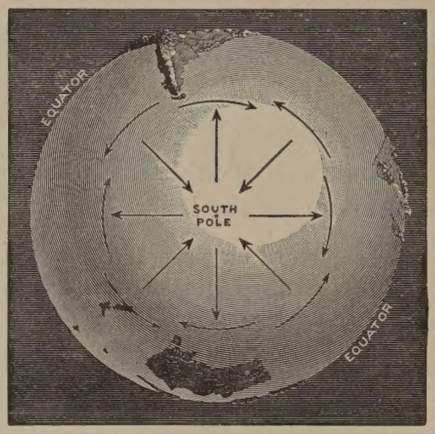
No person has yet reached either pole. These points are in regions of ice and snow.

In our land every midday shadow points towards the north pole, and so all north lines that we may imagine on the earth meet at that point. Going in the opposite direction, all south lines meet at the south pole.

East-and-west lines go round the earth in circles. The largest of these circles is midway between the poles and is called the *equator*, because it divides the surface of the earth into two *equal* parts. All east-and-west lines run parallel with the equator. When we face the north pole, *east* is along the lines to the right, and *west* to the left.

Of course there are no real circles to be seen on the earth, but we may imagine such lines and name or number them. We shall find that these lines are very useful in helping to locate places on the globe. The equator is far south of us. If we were near it we could see the sun overhead, or nearly so, at noon every day. The regions near the equator have no winter. The hot season lasts all the year. Snow and ice are not found there, except on the tops of high mountains.

By climbing any very high mountain near the equator, a person may find the same changes in climate as in going from the equator to either polar region.



Map B.

The lands in the hot belt teem with life. Dense forests cover many parts of the surface. Birds, insects and large animals also abound. In later lessons we shall read about some of these animals.

We shall see maps of the earth in many positions, but we shall always be able to tell the directions on them, if we remember that north and south are towards the poles, while east and west are parallel with the equator.

How many arrows on map *A* point north? How many point south? Which arrows point north on map *B*? On map *C*?

Which arrows are flying south on map *B*? On map *C*? How many arrows on map *A* point east? Which fly east on map *B*? On map *C*?

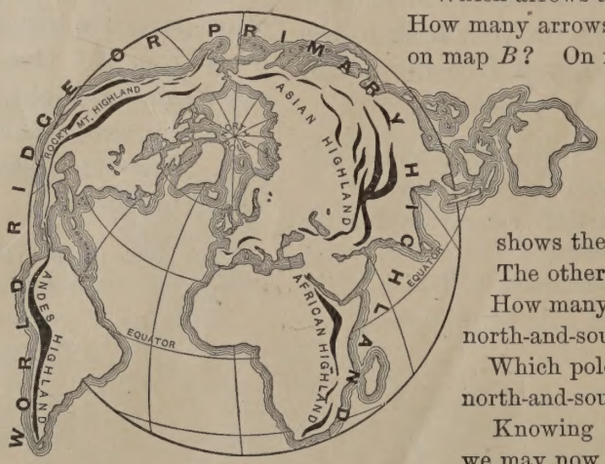
Which arrow points west on map *A*? On map *B*? On map *C*?

A map of half a globe, or *sphere*, is called a *hemisphere*. *Hemi* means *half*. One of the little hemispheres on this page shows the side of the earth having the most water. The other shows the side having the most land.

How many lines on the *Land Hemisphere* are drawn north-and-south?

Which pole is not shown on map *D*? How many north-and-south lines are shown on this map?

Knowing how to tell the directions on the earth, we may now study the positions of the great bodies of land and water.



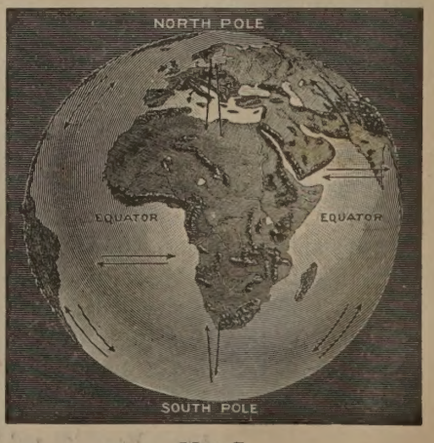
Map D.
Key to the World Ridge Map, page 5.

5. The World Ridge or Primary Highland.

Most of the lands on the earth are in large bodies, instead of being scattered in small islands.

The land is not evenly distributed over the earth. Most of it is north of the equator and therefore much nearer the north pole than the south pole.

About one fourth of the earth's surface is land, — the rest is water. Only a small



Map C.

Water Hemisphere.

Land Hemisphere.

Map showing the World Ridge.

part of the surface south of the equator is land. The sea is not wholly cut into separate oceans by the lands, but it spreads in one large body around them.

Through the great bodies of land, we can trace a long chain of highlands, somewhat in the shape of a horseshoe. We will call this chain of highlands the *world ridge*, or the *primary highland of the world*. The greater part of the world ridge consists of long and wide plateaus, broken by mountains and valleys. In many places it is hundreds of miles in width. Some parts of the world ridge are not very high.

On both sides of the primary highland, the land slopes away to the shores and there dips beneath the sea. Most of the longer slopes are on the inner side of the horseshoe-shaped highland.

These slopes make wide plains between the primary highland and the sea. In many places the shorter slopes, on the outer side of this highland, descend to narrow lowlands along the shores.

Mark on the map the place where you live. On which side of the equator are the ends of the primary highland? In how many places does the equator cross the highland? Which part of the primary highland is nearest the north pole? Nearest the south pole?

6. Continents or Grand Divisions.

Each of the great highlands in the world ridge forms the backbone of a large body of land. These lands are North America, South America, Eurasia and Africa. Southeast of Eurasia lies a great body of land called Australia. *See map below.*

Which of these bodies of land are north of the equator? Which are crossed by the equator?

There are two parts of Eurasia, — Asia on the east, and Europe on the west. Which part is the larger?

North America, South America, Europe, Asia, Africa, and Australia are called *continents*, or *grand divisions*.

Which of these continents is wholly south of the equator?

Bering strait cuts through the primary highland and separates the *Old World* from *America*, or the *New World*.

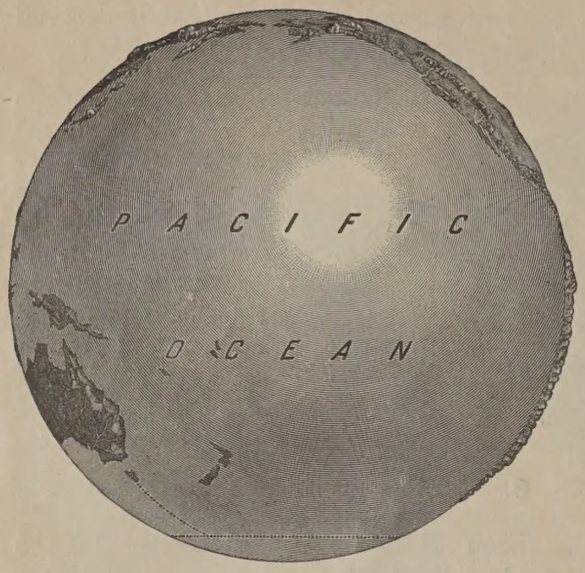
Which continents are in America? Which are in the Old World?

What isthmus connects the two parts of America?

Where is the isthmus of Suez? What seas does it separate?

Which is the larger, — Africa or Eurasia? Africa or North America? Australia or North America?

Which continent is farthest from your home?



7. The Oceans.

The oceans cover about three fourths of the earth's surface and wholly or partly separate the continents from one another.

We may think of the vast area of water around the south polar regions as the main body from which all other parts of the sea extend like arms. Thus, the Pacific is a broad arm lying partly between America and the Old World, on the outer side of the primary highland.

The Atlantic ocean is a long and crooked arm reaching northward between America and the Old World, on the inner side of the primary highland. The Arctic ocean is like a large gulf at the northern end of the Atlantic ocean. The Indian ocean is a short but broad arm partly between Africa and Australia. The Antarctic ocean spreads round the south pole.

What three oceans extend northward from the Antarctic ocean?

Which ocean is east of America? Which is west of America? Which of these two oceans is the larger?

On which side of the Old World is the Atlantic ocean? On which side is the Pacific ocean?

What small ocean adjoins the Atlantic on the north? Which pole is near the middle of that ocean?

What ocean is south of Asia? What lands partly surround that ocean?

Name the continents which border on the Pacific ocean; on the Atlantic ocean; on the Arctic ocean. What oceans border on North America? On Asia? Australia? Africa? South America?

Let us now learn how the rain, the rivers, the winds and the ice change the surface of the continents.

8. The Waste of the Land.

As the weather changes from warm to cold, or from wet to dry, all rocks exposed to the air and the rain slowly decay, but many years may be needed to loosen only a few grains. As rocks decay or crumble they are said to *weather*.

The loosened parts weather finer and finer, forming *rock waste* or *land waste*. In some places the rock waste is thirty or forty feet in depth, but in most places it is thinner. Finely crumbled rock mixed with plant and animal matter is called *soil*. Year after year, plants grow and decay, while myriads of insects and worms live and die in the fine rock waste. The remains of the plants, the insects, the worms and other creatures mingle with the fine rock waste to form the dark rich topsoil. The roots of most plants grow in the topsoil. When it is moist, the plants take from it part of the food needed for their growth.

If rocks were so firm that they would not weather, the plants which require soil could not grow. There would be no trees to supply lumber or fuel, and no cotton fiber to weave into cloth.

In lands that have but little rain and frost, rocks weather very slowly. In our own country, where rains are common and where winters bring frosts and thaws, the decay of rocks is more rapid.

Weathered Rock.

The monument shown in the picture stood for thousands of years in a warm land, where rain seldom falls. There its surface showed but few signs of decay.

Not many years ago, this monument was brought to our country. The rock then crumbled so fast that it became necessary to protect the surface from the weather.

This monument is called *Cleopatra's Needle*. It was brought from Egypt and now stands in Central Park, New York.

9. Rainfall.

Vapor rises from the oceans, and the winds carry it about. The vapor forms clouds from which rain sometimes falls on both the continents and the oceans.

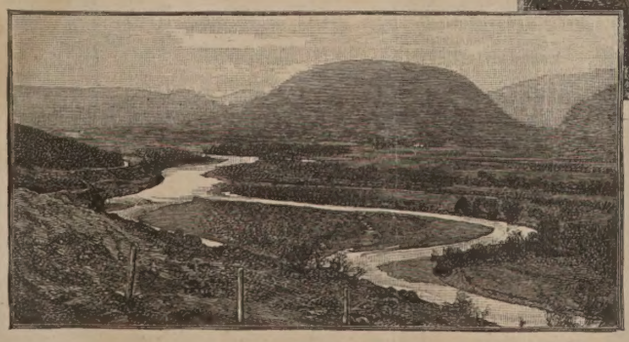
On steep hillsides, much of the rainfall is quickly shed into rills, brooks or larger streams, washing away some of the surface soil. The streams are thus filled with rapid currents of muddy water and often overflow their banks.

On flat land, a large part of the rain sinks into the ground, instead of running away. If the soil is loose and sandy, almost all the rainfall sinks into it.

When the rain ceases and the sky clears, some of the water which is then left on the ground rises in vapor. The drying of the ground is often quickened by winds and sunshine. Water that changes to vapor is said to *evaporate*.

In windy summer weather, many of the large clouds which are seen on the day after a rain are made of water that has evaporated from the ground.

Rain water that stands till it evaporates does not help in washing soil down the slopes. The water which soaks into the ground does but little of that work. The rain water which runs off the surface washes away the greatest amount of soil.



A Stream in Dry Weather.

10. Springs and Streams.

Water that soaks into the ground is called *ground water*. It creeps slowly through the soil towards the lower land. It is the ground water which makes the soil of meadows wetter than that of hillsides. Ground water often creeps slowly through loose rock beneath the soil. In this way the water may travel underground for many miles.

In some dry countries, pipe wells are driven or sunk to reach a supply of ground water. These wells are often drilled through layers of rock, beneath which the water is creeping.

Water may often be seen coming out of the ground through little crevices, thus forming *springs*. Many springs are found at the foot of hillslopes. Others appear along borders of brooks or rivers. In many places the ground water is found rising in the beds of streams or lakes.

The spring which is farthest up the valley trough is called the *source*, or *head*, of the stream that it feeds.

Surface water is often muddy, but nearly all ground water is clear, because it moves too slowly to carry waste. Spring water is therefore much better than surface water for drinking.

Wells also are supplied by ground water.

Most springs flow so slowly that the supply of ground water from one rain lasts till rain again falls. Such springs flow in both rainy and fair weather. In long dry spells, or *drouths*, springs yield less and less water, or they may even cease to flow. The streams then become very low, or perhaps dry up. When soil is frozen, water cannot sink into it. In lands that have long freezing seasons, plentiful rains are needed in autumn to give a good flow of water before the severe frosts harden the soil.

A Stream in Rainy Weather.

In winter, when the ground is frozen, the rain water and the melting snow run quickly to the streams and often flood them. They then cut away their banks and wash the rock waste down their valleys, spreading it over the flooded lands or even carrying it to the sea. The flooded rivers often carry down large blocks of ice and trunks of trees. These do much damage in breaking down bridges and clogging the beds of the streams.

11. Land Waste on the Way to the Sea.

We have learned that in rainy weather the surface waste is washed down the slopes, but in both wet and dry weather the whole sheet or layer of soil and coarser rock waste is very, very slowly creeping downhill. With every change from wet to dry, from warm to cold, or from frost to thaw, the rock waste is weathering finer and finer as it moves down the slopes. The fine and light surface waste creeps fastest. The undersoil scarcely moves, and the firm rock beneath stands still. The steeper the slope, the faster the waste creeps.

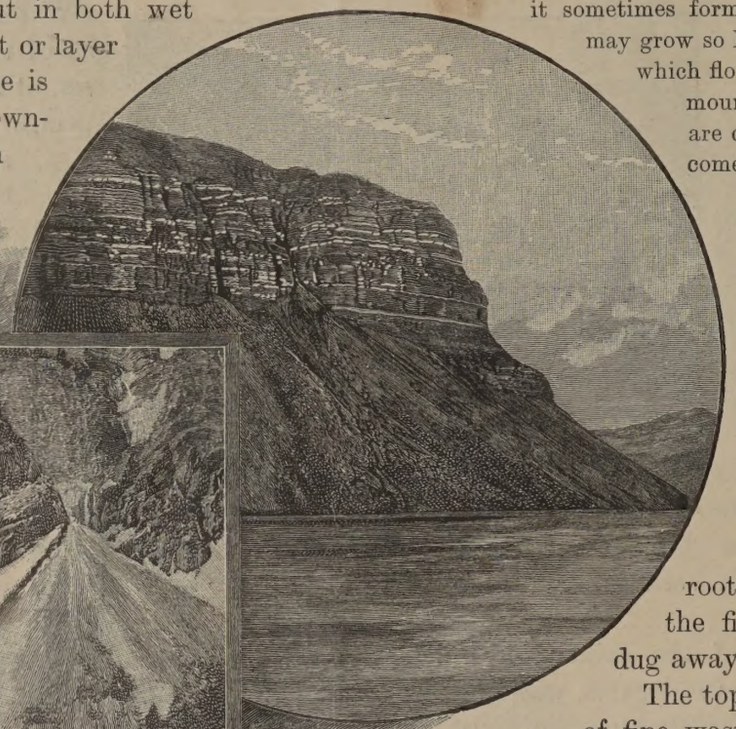
Steep Alluvial Fan.

On many steep hillsides the fine waste creeps and washes away nearly as fast as it forms, and only the coarser rock waste is left. The roots of grass and trees do much to prevent the soil from being rapidly carried away.

Gently-Sloping Alluvial Fan (Chamouni, Alps).

On rough hills, there are often rocky ledges from which the waste is washed or blown nearly as soon as it forms. On some mountains, bare crags cover much of the surface. The coarse rock waste rolls down, making steep slopes at the foot of the crags. The finer waste is washed into the lowlands.

When waste is washed down from valleys on mountain slopes, it sometimes forms great fan-shaped heaps. These may grow so large that they push away streams which flow in the valleys at the base of the mountain slopes. These heaps of waste are called *alluvial fans*. They often become very large in dry countries where the streams are not strong enough to wash the waste down the valleys. Coarse waste forms steep alluvial fans, but the slopes are more gentle where the waste is fine.



Rock Waste at Foot of Cliff (Spitzbergen).

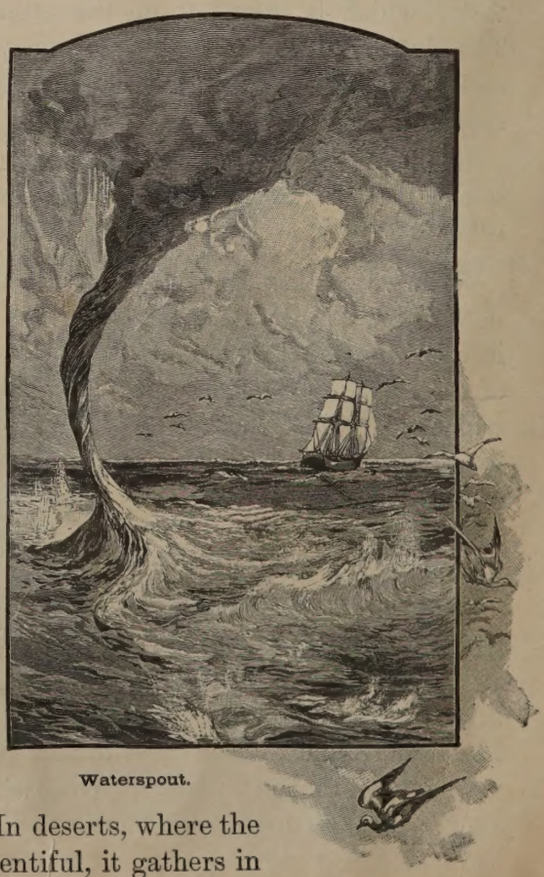
On gentle slopes, the soil moves very slowly and becomes deep and fine. There the rocks may decay for many feet below the surface, thus making plenty of soil for the roots of plants. In order to reach the firm rock, the waste must be dug away to a great depth.

The topsoil in valleys consists mainly of fine waste that has been washed from the higher land. Most of the ground water flows into the valleys and helps to keep the soil moist. For these reasons many of the best farms are in lowland valleys.

12. Work of the Winds.

Strong winds cannot reach soil that is covered with grass or trees, but in dry lands where there are but few plants the winds sweep over the ground and scatter fine rock waste far and wide. Coarse sand is drifted along like dry snow in winter.

The particles of sand are blown against one another and against bare rocks. Thus both the sand and the rocks are ground to dust. In deserts, where the drifting sand is plentiful, it gathers in



Waterspout.

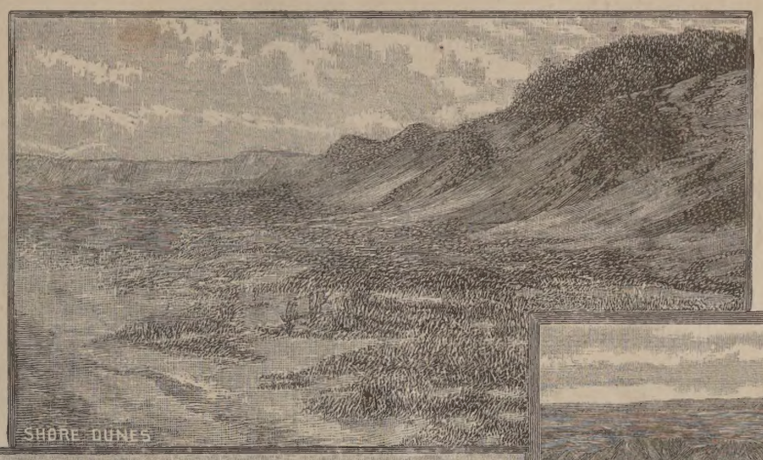
hills called *dunes*. Some of these sandy hills are from three hundred to six hundred feet high. Dunes are also found on sandy shores. Waves throw sand upon the beaches, and the winds may then blow it inland. Fields, forests and villages are sometimes buried by drifting sand.

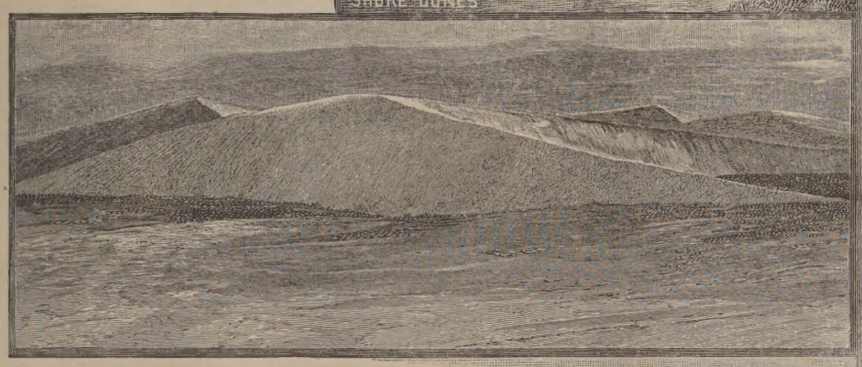
Desert whirlwinds take up fine dust, which may then be blown many miles away. Some of the dust falls into the sea, and the winds thus help along the work of rivers.

Sails of ships on the ocean west of the desert of Sahara are often covered with reddish dust from that barren region. Locate this great desert on the map of Africa.

Whirlwinds at sea are generally formed under heavy clouds from which whirling funnel-shaped spouts seem to descend and join the spray raised from the waves. The long whirling funnels are called *waterspouts*.

Waterspouts occur most frequently over the oceans near the equator, but they are also seen east of our country, over the warm parts of the ocean. The whirling winds of waterspouts are sometimes strong enough to dismast vessels.



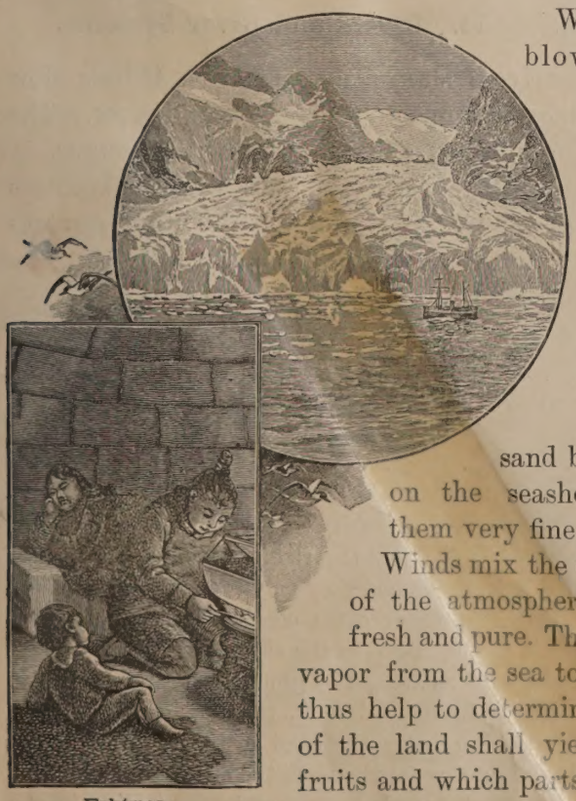


Desert Dunes.

Winds scatter the seeds of some kinds of plants, and also aid in the flight of birds by lifting them, somewhat as kites are lifted. If it were not for currents of air there would be no sailing-vessels nor windmills.

Winds are sometimes so violent that they wreck vessels and blow down trees and buildings. In later lessons we shall learn more about the work of winds.

Wind-Swept Desert of Sahara.



Eskimos.

Winds not only blow dust and sand about, but they also sweep over the sea and make waves. The waves which roll against the land wash stones and sand back and forth on the seashore, grinding them very fine.

Winds mix the different parts of the atmosphere and keep it fresh and pure. They carry water vapor from the sea to the land, and thus help to determine which parts of the land shall yield grain and fruits and which parts shall remain barren.

13. Snow and Ice.

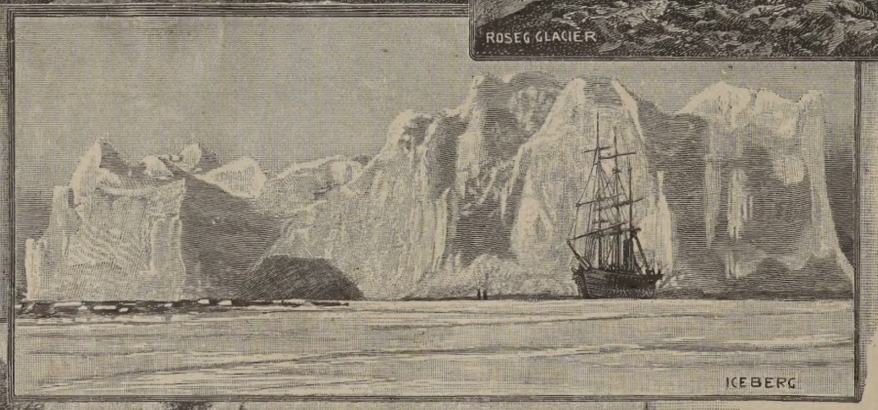
On some mountains, snow lies all the year and becomes very deep in the high valleys. Rain soaks into the snow, making it more compact. The heavy mass slowly changes into ice. As the layers of ice on a mountain grow thicker they creep down the slopes. When the ice enters the lower and warmer valleys, it gradually melts and forms brooks or rivers. Such a body of ice slowly moving down a slope is called a *glacier*.

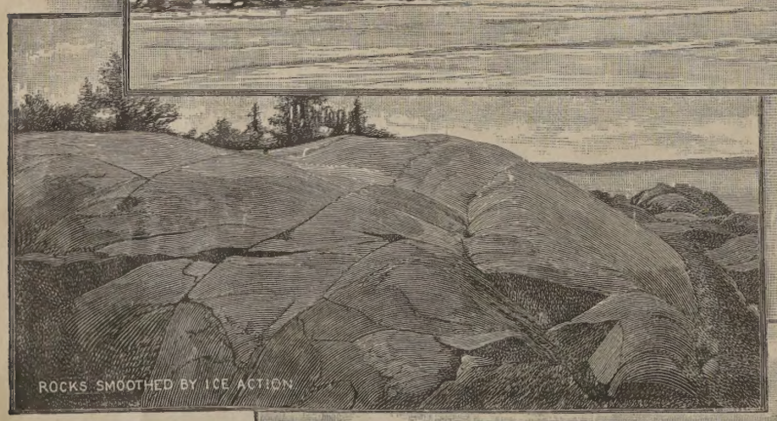
Rock Waste at the End of a Glacier.

Glaciers carry along rock waste that rolls onto them from higher ground. They drag along stones, gravel, sand and clay also, beneath the ice, — scraping the surface over which they creep. The ice sometimes hollows out basins in the bottoms of valleys.

Coarse rock waste is left in uneven heaps near the melting ends of glaciers, but most of the finer waste is carried away by the glacier streams which flow into the lowlands. *See picture on page 9.*

Sometimes the heaps of waste make barriers across river valleys, and lakes then form above the barriers.





Rock waste moving on a glacier, or left in a heap at the end of a glacier, is called a *moraine.* The side or *lateral* moraines are formed of waste that is scraped from the sides of the glacier trough or that falls onto the border of the moving ice. When two branches of a glacier unite, the moraines along the sides which meet form a *medial* moraine. The picture of a glacier on this page shows both medial and lateral moraines.

The heap of waste at the end of a glacier is a *terminal* moraine.

In former times there were glaciers in some parts of the world where none are now found. Lakes abound in such regions. The water lies in the basins scraped out by the ice, or behind the barriers which the rock waste formed across old river valleys.

One of the pictures on this page shows a rocky ledge, smoothed and rounded by the action of ice. Another picture shows a long low hill, built of coarse rock waste which was left in this form by an ancient ice-sheet. Such a hill is called a *drumlin.* There are many old glacial lakes, smoothed rocks and drumlins in the northeast portion of our country.

When glaciers push their way into the ocean, huge blocks of ice break off and float away. These floating masses are called *icebergs.* They carry stones, gravel and fine rock waste into the sea.

When the icebergs melt, what becomes of this rock waste? *See picture on page 9.*

Icebergs chill the damp air around them and thus cause dense fogs. Many vessels have struck blocks of floating ice and have been sunk or partly wrecked.

Far away in the north is a land called Greenland. The interior of that land is covered with a thick sheet of ice and snow that moves very slowly towards the ocean on either side. Wide and deep glaciers from this ice-sheet creep into the sea, where huge blocks of ice break off and form icebergs.

14. Rivers and River Systems.

Some rivers start from springs. Others flow from lakes, swamps or melting ice and snow. The beginning of a river is called its *head* or *source.*

While on the way to the sea, a river becomes larger and larger as it is joined by other streams from side valleys.

Large cities are often built near rivers. If the water flows swiftly, it may be used to turn mill wheels. If the rivers are deep enough, steamers and other vessels may go from place to place, carrying passengers and freight.

In dry countries where no branches join the rivers, they become smaller and smaller as they flow along, and they may even disappear before they reach the sea. The water often continues as *ground water* much farther than it can be traced in the surface streams.

Many wells in dry regions are fed by ground water thus supplied by vanishing streams. In some deserts, travelers can reach the ground water by scraping away the sand in the valley troughs. The water may be only a few feet beneath the surface.

During long periods of drouth, trees may be kept alive by the ground water which reaches their roots deep in the rock waste.

The lower end of a river, where it flows into the sea or into some other body of water is known as the *mouth* of the river.

Many of the largest cities in the world are built near the mouths of rivers. These cities carry on trade with one another, and collect and distribute merchandise for the people in the inland valleys.

River Systems and River Basins.

A river and all its branches form a *river system*. The largest or the longest stream in a system is known as the *main* river.

How many river systems are shown in the above picture?

There are many river systems in each of the continents. Some of the main rivers flow three or four thousand miles from source to mouth. On the way they receive many branch streams called *tributaries*. Large rivers are sometimes tributaries of still larger rivers.

America.

The deep parts of rivers, where steamers and other crafts may go from place to place, are said to be *navigable*. Some rivers are navigable for many hundred miles from the sea.

lower the slopes of their basins are worn.

Some of the most important divides on the earth cross wide plains whose slopes are too gentle for the eye to detect.

The Amazon basin in South America is the largest in the world. Its main river pours into the ocean more water than any other stream. This basin is crossed by the equator and covers more than two million square miles. Steamers can go for thousands of miles up and down the many branches of the Amazon system.

The Mississippi basin is the largest in North America, but is only about one half as large as the Amazon basin. The map on this page shows where these great basins are.

Flooded Connecticut River.

15. River Basins and Divides.

All the land which sheds water into a single river system forms a *river basin*. The basin generally takes the same name as the main river in the system.

Find the line which bounds the basin of the river marked *C* in the picture at the top of this page. This line runs along the top, or *crest*, of the ridges, and separates the slopes in basin *C* from those in the other basins which adjoin it. Such a line is called a *divide* or a *water parting*. It divides the slopes of the basins.

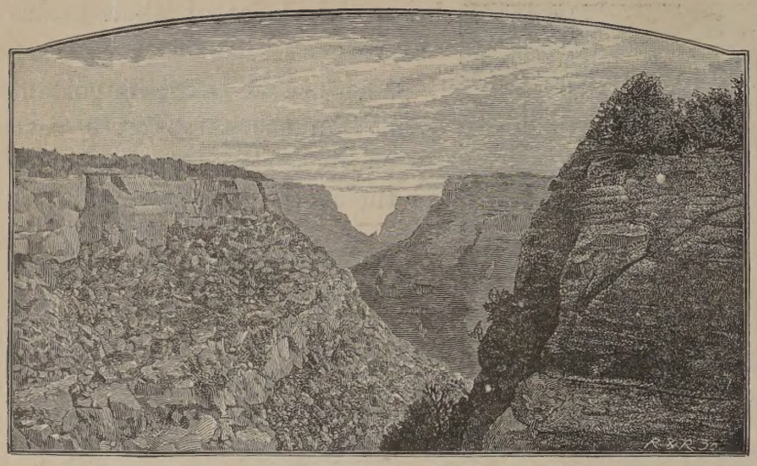
A river system drains all the land which forms its basin. From the slopes of the basin, the streams carry the land waste towards their mouths. The longer the streams continue to flow, the

16. Young and Old Lands.

A swift river rolls stones and sand along in its bed and thus wears it deeper and deeper. After long ages the bed in which the river flows may be worn down almost to the level of the sea. Then the slope of the stream will be gentle. Its current will be slow and its wearing power very slight.

Most large rivers flow slowly, because they have already worn their beds down to gentle slopes. The slow current favors the use of boats on rivers.

While a stream is deepening its bed, the rock waste all over its basin is weathering finer and finer. This waste is always creeping and washing into



Narrow Valleys in a Young Land (Colorado).

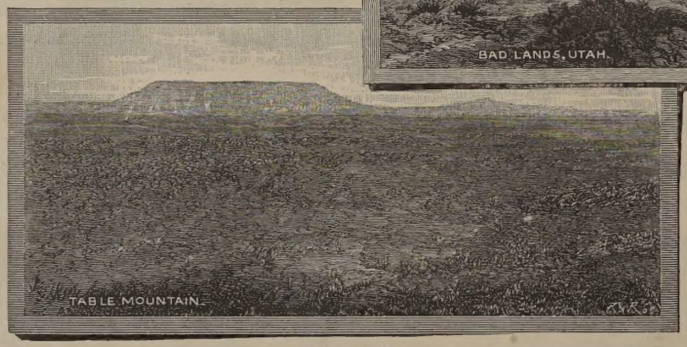
the valley bottom or into streams that carry it away. Thus the valley grows wider and its side slopes become more gradual. The uplands or hills on either side become smaller and lower, as they slowly waste away.

In a very long time, even a highland may be worn away to a lowland. Thousands of years are needed for this great work, but the earth is very old, and highland after highland has been worn down.

Lands whose valleys are not yet widened may be called *young*, even though their streams have been working for thousands of years.

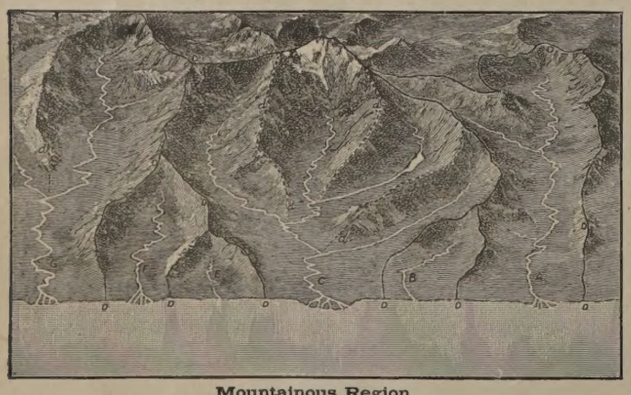
The picture at the top of this page shows a young land in which rivers have cut only narrow valleys. The uplands between the valleys are almost level and the rock waste creeps slowly down the gentle slopes and then falls into the valleys.

Many small streams are gnawing into the upland and after a time it will not be so smooth as it now is. We may know that this is a young land, because the streams have not yet carried much of it away.



Old Land.

Lands whose valleys are greatly widened, and whose hills or mountains are almost worn away, may be called *old*.



Mountainous Region.

In the middle-aged country, the uplands are deeply and widely cut by valleys. The rain water runs quickly from the uplands and carries away much land waste. In the old land, most of the upland is worn down and only a few hills remain. In time, even the hills will waste away. Then the streams will become sluggish, but they may be useful as water ways.

We cannot watch a land grow to old age, for the change is very slow, lasting many hundred thousand years.

17. Flood Plains and Deltas.

After heavy rains, or after much snow has quickly melted, great volumes of water run down the brooks and into the rivers. Then the rivers often overflow their banks and spread over the flat meadows, called *flood plains*, on either side.

Flooded rivers are very muddy, for they not only cut their own banks, but their swollen branches also bring them a great deal of land waste from the sides of their

Middle-Aged Land.

valleys. The water moves slowly on the flood plains and deposits thin layers of mud, called *silt*. When the flood is over, this silt gives fresh food to plants.

In narrow valleys the flood plains extend for only a short distance on either side of the river. In broad valleys the flood plains may be several miles wide.

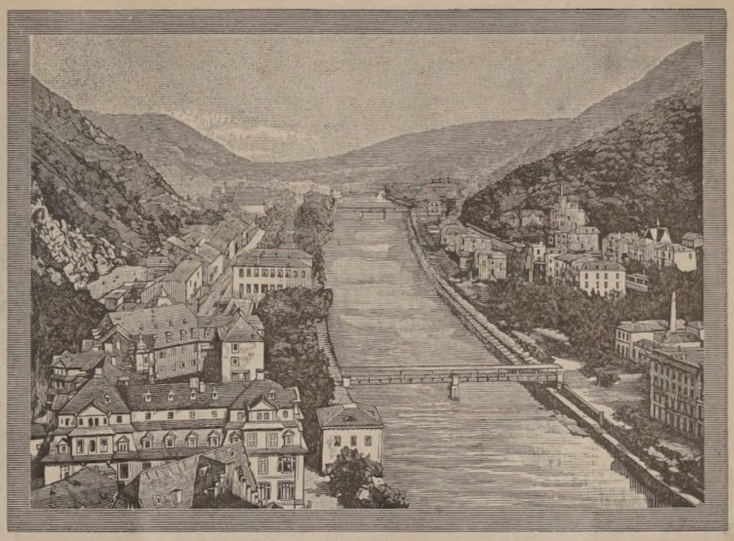
Many people live on flood plains because they are so fertile. In dry countries, flood plains are the best places for people to settle, because the river water can be led in canals and ditches across such plains.

Most of the silt borne along by rivers is slowly washed down the

Mountainous Region and Coastal Plain.

channels to the sea. A large part of the silt settles near the river mouths, where the water flows more slowly.

Delta in Alaska.



City on a Narrow Flood Plain. (Ems, Prussia.)

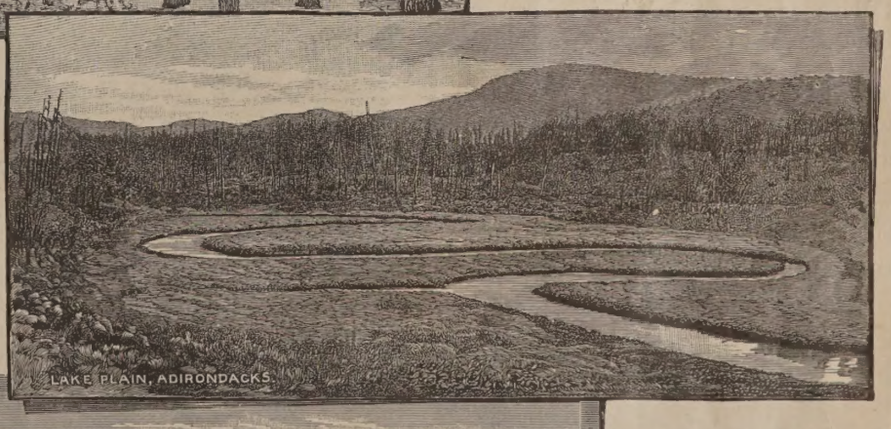
The settlings, called *sediment*, form low and flat plains in which the rivers often divide into many branches, called *distributaries*. The distributaries sometimes change their course, cutting new channels across the plain.

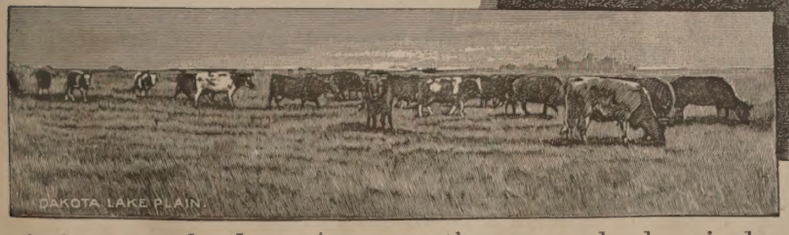
Lowlands thus formed at the mouths of rivers are known as *deltas*. Most deltas are the lower ends of flood plains built out into the sea. The soil of delta plains is generally fine and fertile.

In the far east, about halfway round the earth from us, there is a large delta plain on which millions of Chinese people live. Most of this delta was made by the Yellow river.

This river sometimes takes a new course across its delta plain. Fields, villages and cities are then flooded or swept away, and many people are drowned.

The Mississippi river, in our own country, has made a flood plain several miles wide and hundreds of miles long. Its lower part is a very large delta plain. These lowlands built by the great river are very fertile.





18.

Coastal Plains and Lake Plains.

Many parts of the land were formerly under the shallow water of the ocean border. Ages ago they were slowly raised from beneath the sea and became dry land. The sea-bottom near the shores of the continents is slowly made smooth by layers of silt washed from the land. When evenly uplifted, the smooth bottom forms plains having very gentle slopes. Fossil seashells are often found in the rocky layers of such land.

A plain that was once part of the sea-bottom and that is now near the coast is called a *coastal plain*.

Before the coastal plain shown in the picture on the opposite page was raised from the sea, the shore was nearer the high land. The mouths of the rivers were then at the old shore line. The rivers now flow across the young coastal plain.

The rivers *A* and *B* were at one time in separate systems but are now joined into one.

Every continent has coastal plains at some parts of its border. These plains vary in width from a few miles to hundreds of miles. The surfaces of coastal plains quickly weather into fine soil and often make good farming lands. The map on the next page shows a large coastal plain in our own country. Near the coast the plain is still

Mountains (Jungfrau, Alps).

smooth, but farther inland it is already much worn by streams. Pine forests cover parts of the plain, while cotton and tobacco grow in the more fertile districts.

Some plains were formed under lakes and were laid bare when the water was drained away.

One of the pictures on page 13 shows a great *lake plain*, with broad harvest fields. This plain is so young that hardly any valleys are worn below its level surface. Find the lake plain on the map below.

Many lake plains are found in valleys among mountains. These plains are small, but in regions where the steep slopes have only a thin and stony soil left on them, the meadows in the old lake bottoms are of great value for farming.

Plains that stand high above sea level are called *plateaus*. Most of the rocky layers in plateaus were made very long ago beneath the sea.

Some plateaus are so old that broad valleys have been worn in them, thus making many small plateaus out of each large one. The map on this page shows a high and wide plateau region in our own country.

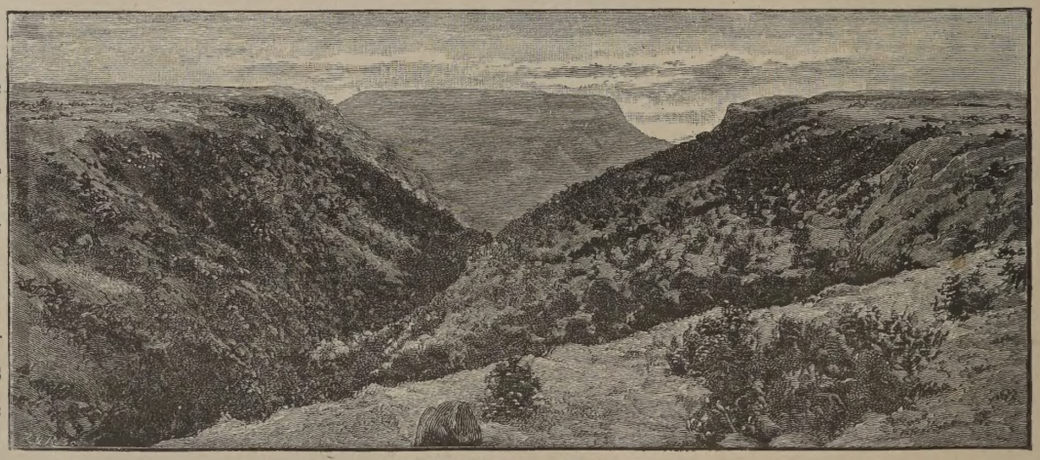
Low plains can have only shallow valleys, but plateaus are often broken by deep valleys, making travel very difficult.

19. Mountains.

Mountains are rugged parts of the earth's surface that rise high above the surrounding country. They are generally formed by the wearing of deep valleys in regions that have been greatly uplifted. The mountains are the high parts not yet worn away.

While the great masses are being lifted, their rocks sometimes fold or break underground. Every snap or slip in the rocks causes the surrounding region to tremble. The trembling is called an *earthquake*.

Some earthquakes are very faint, but others are violent enough to throw down houses. The next lesson tells another cause of earthquakes.



Valleys cut in a Plateau.

The United States.

Some mountain regions are worn away to sharp rocky peaks. The mountains of other regions are rounded like domes. Still others have flat tops and steep sides.

A high and rugged ridge, or several such ridges near one another, may be called a *mountain range*. Some ranges are hundreds of miles long.

Find five ranges on the map. Which of these ranges lie along the border of the great plateau region in our country?

A number of ranges having the same general direction in one great highland form a *mountain system*.

All the ranges in the western part of our country belong in the *Rocky Mountain system*. This mountain region was very unevenly lifted

and is now so greatly worn away that its surface has gone down to beds of rock that were once deeply buried. It is in such deep layers of rock that veins yielding gold and silver ore are found. When the surface is worn down near them they can be mined.

High mountains reach into the upper air which is cold, even when the air in low valleys not many miles away is very warm. On the lofty peaks, three miles or more above sea level, the air is so light or thin that persons find it difficult to breathe there. The lower air, near the level of the sea, is dense because it is pressed down by all the air above or upon it.

Winds are active around high mountains, and clouds form quickly in the cooled air as it rises to cross the ranges. When the air is cooled enough, it gives out snow or rain. Snow often falls on the mountains, while rain is falling in the lower valleys.

Great snowslides or landslides sometimes rush from the mountain sides into the valleys, uprooting trees and burying houses. A slide of snow or of rock waste is called an *avalanche.*

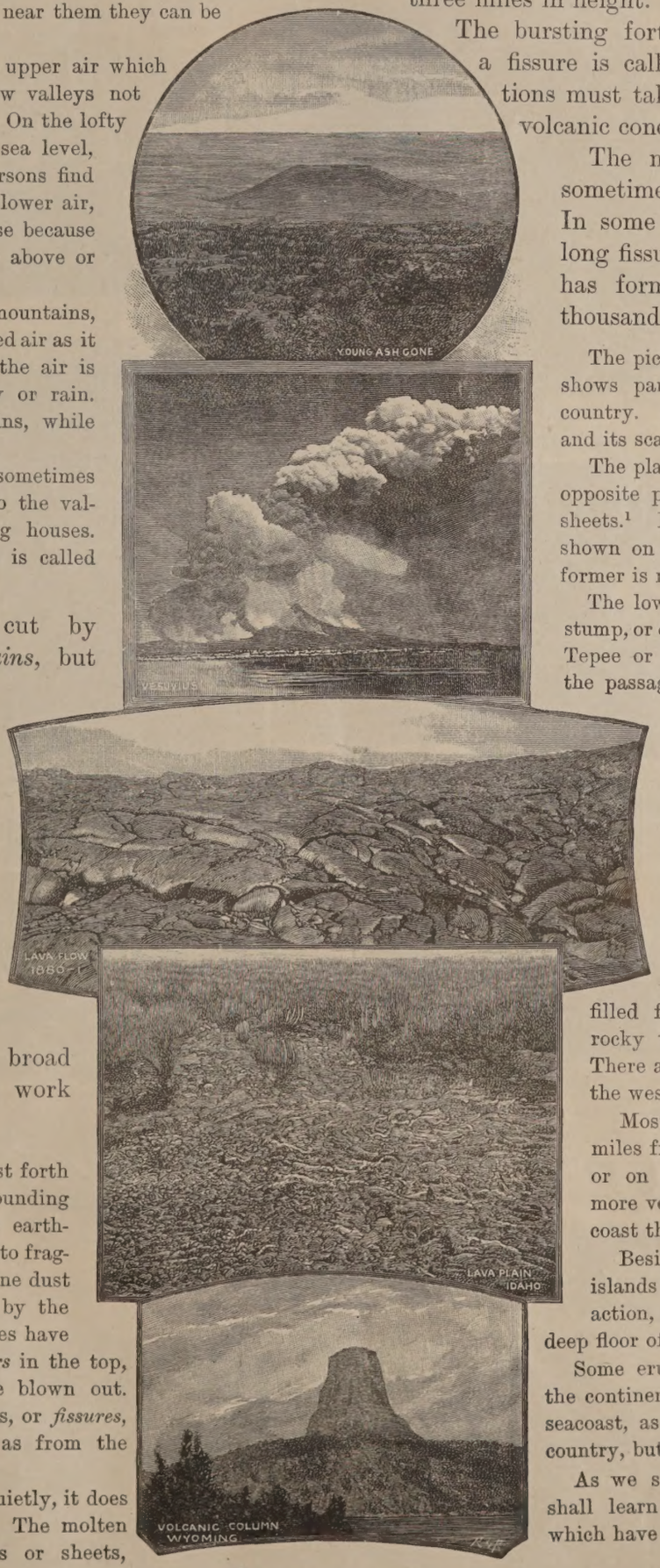
Some plateaus, deeply cut by streams, are called *mountains*, but many mountains are higher than plateaus and are not so evenly raised above the sea.

20. Volcanoes.

In some parts of the world, melted rock, or *lava*, has been pushed up from beneath the surface through breaks in the surface rocks, and has cooled in great cone-shaped heaps or in broad sheets. In some places this work is still going on.

Steam and gases sometimes burst forth with the lava, shaking the surrounding country and thus causing severe earthquakes. The lava is then blown into fragments called *ashes*, or even into fine dust that may be carried many miles by the wind. Cones built of lava and ashes have steep sides, with hollows or *craters* in the top, where the gases and ashes were blown out. Lava often escapes through cracks, or *fissures*, in the sides of cones as well as from the craters.

When the lava is pushed out quietly, it does not form such steep-sided cones. The molten rock then runs in long streams or sheets, and sometimes covers many square miles of country. The more liquid-like the lava, the farther it flows and the gentler the slopes of the cone become.



Each of these cone-shaped masses is called a *volcano.* It may be no larger than a hill, or it may be two or three miles in height.

The bursting forth of lava from a volcano or a fissure is called an *eruption.* Many eruptions must take place to build up a great volcanic cone.

The molten rock from volcanoes sometimes spreads out in wide plains. In some places, lava has poured from long fissures in the earth's surface and has formed plains that cover many thousand square miles.

The picture marked "Lava Plain, Idaho," shows part of a great lava plain in our country. The lava has weathered slightly and its scanty soil now supports sage brush.

The plateau shown in the picture on the opposite page is built of many thick lava sheets.[1] It is older than the lava plain shown on this page, for the surface of the former is more deeply cut by valleys.

The lowest picture in the group shows a stump, or column, of lava known as the Mato Tepee or Bear Lodge. This column filled the passage in the rocks through which the molten lava rose from its deep source. At that time the surface of the country was much higher than at present. It has since worn away, and the hard lava of the column remains standing above it.

Deep fissures filled with hard lava have been laid bare, when the softer rock about them has been worn away. These old lava-filled fissures sometimes rise like long rocky walls, and are known as *dykes.* There are many lava necks and dykes in the western part of our country.

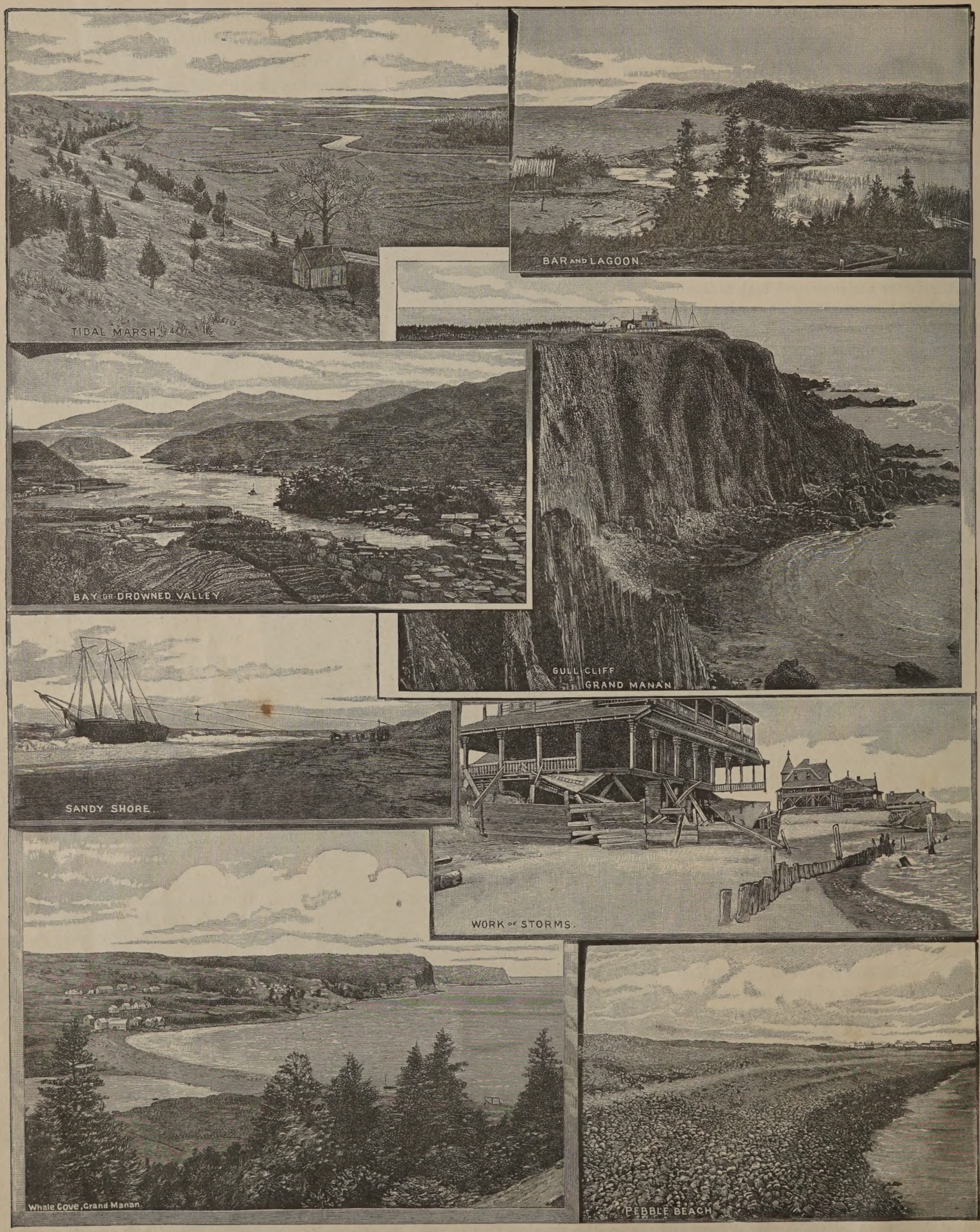
Most volcanoes are found not many miles from the coasts of the continents, or on islands not far offshore. Many more volcanoes are found near the Pacific coast than near the Atlantic.

Besides these, a large number of small islands have been wholly built by volcanic action, sometimes even growing from the deep floor of mid-ocean.

Some eruptions have also taken place on the continents several hundred miles from the seacoast, as in the Rocky mountains of our country, but such eruptions are rare.

As we study the different countries, we shall learn more about volcanoes, some of which have destroyed cities and towns.

[1] This plateau is in the Western Ghats, India, and is part of the Deccan lava flow. In that region, the lava has spread over an area of about 200,000 square miles.


TIDAL MARSH.
BAR AND LAGOON.
BAY OR DROWNED VALLEY.
GULL CLIFF
GRAND MANAN
SANDY SHORE.
WORK OF STORMS.
Whale Cove, Grand Manan.
PEBBLE BEACH.

21. Waves.

Winds blowing over the sea make waves. Under strong winds the waves are sometimes thirty or forty feet high, from trough to crest.

Breakers or Surf.

If a hanging rope is struck or shaken, waves glide along it. The rope simply bends to form the waves.

The water in waves only rises and falls, like the waves in the rope, but the *wave-forms* travel forward. The larger they are, the faster they move. In the open sea some waves travel at the rate of more than a mile a minute.

Storms at sea are dangerous chiefly on account of the waves. They pitch vessels about and sometimes wreck them.

The great waves produced in a storm may spread far across the ocean. They lose height as they go, and are then called *swell.*

When the swell approaches shallow water near shores, it increases in height again and rolls forward in the form of *breakers* or *surf* on beaches.

Waves on beaches often wash pebbles and sand up and down, grinding them finer and finer. Great storm-waves are strong enough to move large blocks of rock.

When severe earthquakes occur near coasts or at the bottom of the sea, they produce broad waves, called *earthquake waves,* that travel with great speed. Such waves rolling upon shallow shores become very high and strong. Vessels in harbors are sometimes dragged from their moorings and carried by earthquake waves far up the shores.

22. Shore Forms.

Straight or regular shores are found where smooth bottoms have been slowly raised from the sea.

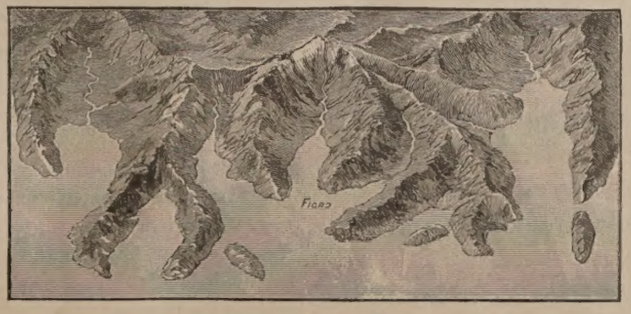
Along such shores there are but few bays in which vessels can find shelter from winds and waves, but there may be good harbors in the river mouths.

Irregular shores occur where hilly or mountainous lands have partly sunk beneath the sea.

Valleys that have sunk beneath the sea are said to be *drowned.* The *drowned valleys* form *bays.* Deep, long and narrow bays are known as *fiords.* The ridges, hills, or other parts of the land between the drowned valleys, may form islands or peninsulas.

The picture at the bottom of this page shows several fiords formed by the partial drowning of the mountainous region shown in a picture on page 12. Some fiords are many miles long and are very deep.

There are many fiords along the northwest coasts of North America and Europe.



Fiords or Drowned Valleys.

The word *peninsula* means *almost an island.* Peninsulas are only partly surrounded by water. A *neck* of land joining a peninsula with another body of land is called an *isthmus.*

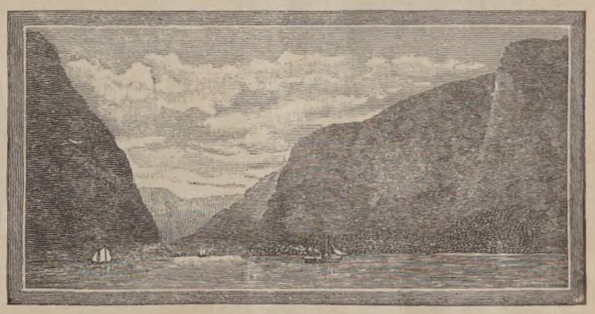
A *strait* is a body of water joining two larger bodies of water. A strait may be many miles in width, but it is always narrower than the bodies of water which it connects. The word *strait* means *narrow.*

Some long and shallow straits are called *sounds.* The name *sound* may also be given to any body of water partly inclosed by islands. Sounds and straits are often only drowned valleys. Some of them are very deep.

Large arms of the sea are called *bays, gulfs* or *seas.* Some of these are hundreds of miles long and wide.

Bodies of water that afford shelter to vessels are known as *harbors.* Many fine harbors are found in the mouths of rivers or in drowned valleys.

Along irregular coasts vessels find shelter in bays or behind islands. Men living near such coasts generally become good sailors.



A Fiord, Norway.

Storm-waves slowly wear away parts of some coasts. The waves beat most violently on headlands that jut far out into the sea. As these are worn back, their steep faces form *sea-cliffs.*

Low and sandy shores may be so rapidly worn that houses are undermined and washed away.

In cold regions floating ice helps to change the shore lines. Tons of sand, pebbles and large rocks become imbedded in the ice and are thus borne out to sea. Ice is also driven by waves against the shores, where it helps to grind even the rocky cliffs.

Rock waste from headlands often forms beaches at the foot of the cliffs. Part of the waste is also carried by waves along the shores, where it is spread out into *beaches* or built into *bars,* cutting off parts of bays. In this way the shores become straighter.

Waves often gather sand from shallow bottoms and throw it up in bars off low shores, thus partly inclosing bodies of water, called *lagoons.*

Fine waste from the land settles in the quiet lagoons, and

water-plants then grow there. In time the lagoons may thus be filled, forming *marshes*. There are many thousand acres of marsh land formed in this way along the eastern coast of our country.

Sometimes the beaches and bars are made of cobblestones or of pebbles worn round and smooth, by being rolled against one another. Many beaches and bars are made of sand. More than one half the shores of the United States are low and sandy.

23. Belts of Heat.

The sun is a hot globe more than a million times as large as the earth. This great globe is very far away, yet it keeps the earth warm enough to support life.

If, when Columbus set sail on his first voyage to America, some object could have left the sun and traveled at the rate of twenty-five miles an hour towards the earth, that object would still be several million miles away from the earth. The average distance of the earth from the sun is about 93,000,000 miles.

Heat Belts.

The sun's rays shine through clear air without warming it very much, but they warm the clouds and the dust in the air, and also the surface of the land and the sea. All these help to warm the air about them, but the land and the seas warm the air much more than the clouds and the dust do.

Figure 1 shows how the sun shines on different parts of the earth. Over the line *B* all the rays are nearly vertical. Over the line *A* the rays strike the earth with greater slant. As many rays shine on *B* as on *A*, but the slanting rays spread over the greater surface, and therefore cannot heat it so much. The more nearly vertical the rays are, the greater their heating power.

Near the equator the sun's rays are vertical, or nearly so, at noon every day. There the air is hot all the year, except high above sea level. That region of hot air is called the *hot belt*.

Around the poles the rays are very slanting, and the air is always cold or cool. The polar regions are known as the *cold belts*.

Between the *hot belt* and the *cold belts*, there are other belts neither so hot nor so cold. On either side of the hot belt lies a belt of land and sea on which the sun's rays fall with but little slant. We will call these two belts the *warm belts*.

Between the warm belt and the cold belt, on each side of the equator, lies another belt on which the rays fall with a great deal of slant. These two belts are the *cool belts*.

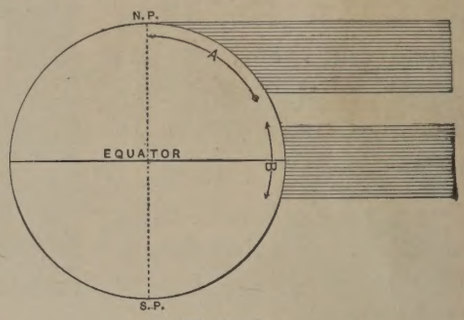


Figure 1.

In later lessons we shall learn why the lines between the belts are somewhat irregular.

Between the heat belts, there are no sudden changes from hot to warm, from warm to cool, or from cool to cold. All the way from the belt of greatest heat to the places of greatest cold, there is only a very gradual change.

There is very little land in the cool and cold belts south of the equator. Name in order the heat belts which would be crossed in going from pole to pole.

24. Changes of Season.

Once a year the earth moves, or *revolves*, in an almost circular path round the sun. This path is called the earth's *orbit*.[1]

The earth is one of many bodies, called planets, that revolve round the sun. The diagram on the opposite page shows which part of the orbit the earth moves through each month. The arrows indicate the direction in which the earth moves.

The earth's axis does not stand upright from the plane of its orbit, but slants so that the strongest sunshine falls north of the equator during about one half of the year, and south of the equator during the other half.

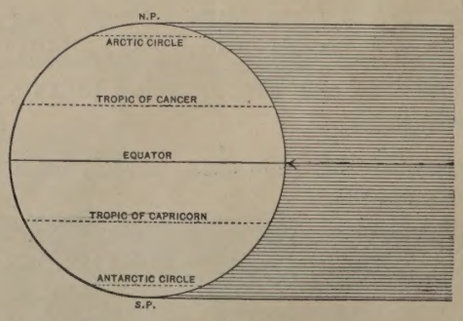


Figure 2.

All the year the axis of the earth *points towards the north star* and is therefore called a *fixed axis*.[2] Every moment the earth changes its own position with regard to the sun, but the

[1] The orbit is an ellipse, with the sun near the center.

[2] Although the earth's axis makes no perceptible change from year to year, yet in long ages a great change takes place. In about 12,500 years the bright star *Vega*, in the constellation of *Lyra*, will be the north star. In about double that length of time, the axis will again point towards the present north star.

Even now the north star is not *exactly* in line with the earth's axis.

direction of the axis remains the same. The northern end of the axis leans towards the sun in June, when the sunshine is strongest north of the equator; and away from the sun in December, when the sunshine is strongest south of the equator.[1] As the earth moves round its orbit, the sun's rays are strongest north of the equator during our spring and summer, but south of the equator during our autumn and winter.

Half the year, the vertical rays fall north of the equator, but they fall farthest north on the twenty-first day of June. At that time the northern summer and the southern winter begin. *See figure 3.*

During the other half of the year the vertical rays shine south of the equator, but they shine farthest south on the twenty-first day of December, — at about Christmas time. Then the northern winter and the southern summer begin. *See figure 4.*

Our spring opens on the twenty-first day of March, when the vertical rays fall on the equator, and the days and nights are everywhere of equal length. The earth is then moving in that part of its orbit which brings the vertical rays farther and farther north of the equator and makes our days longer than the nights. The spring is the *warming season* between winter and summer. *See figure 2.*

The first day of our autumn brings the earth to that part of its orbit where the sun again shines over the equator, but the vertical rays are each day moving southward, making our nights longer than our days. The northern autumn, or the *cooling season* between summer and winter, begins on the twenty-second day of September. *See figure 2.*[2]

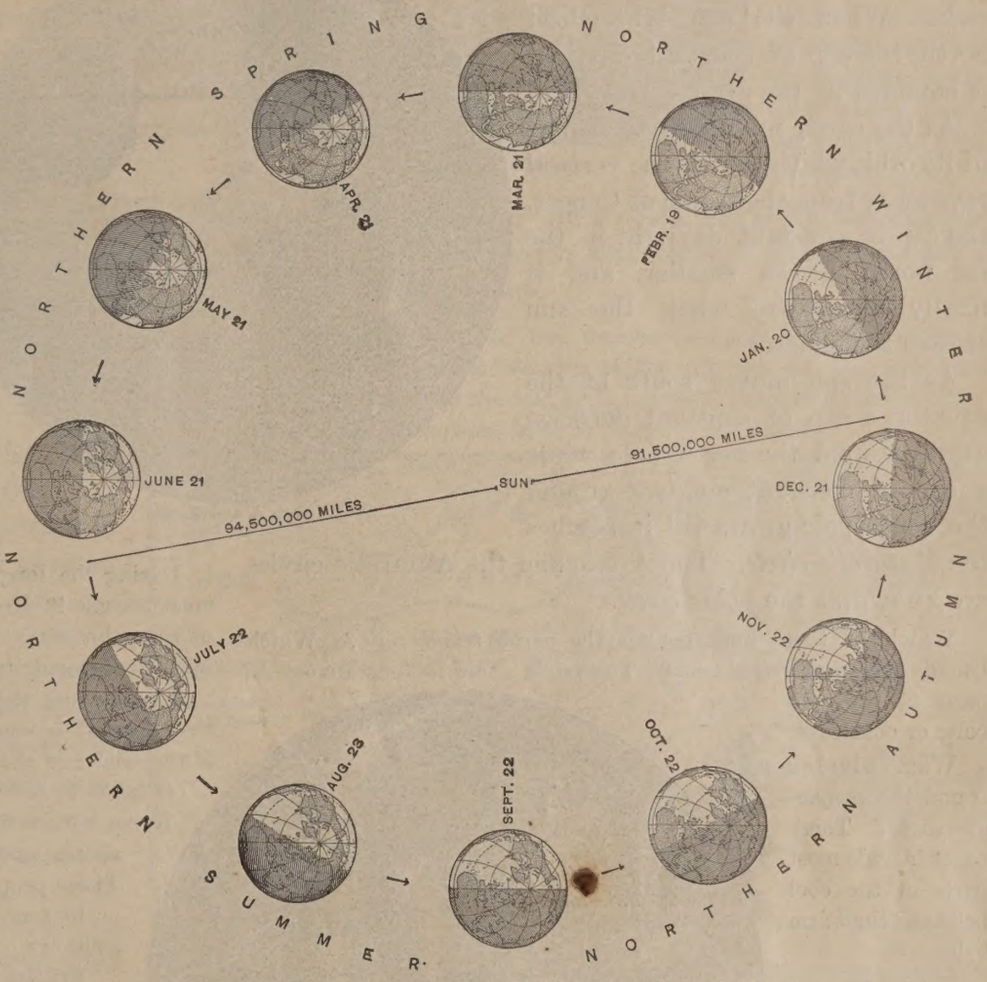


Diagram showing the Position of the Earth in its Orbit each Month.

25. The Zones of Light.

The line around the earth, upon which the vertical rays fall when farthest north, is called the *tropic of Cancer.*

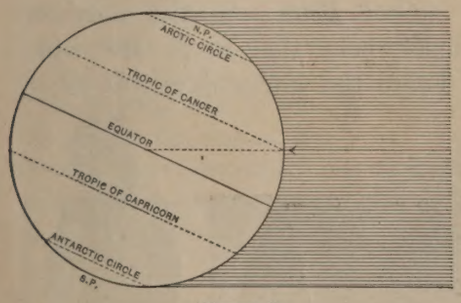


Figure 3.

The line upon which the vertical rays fall when farthest south is called the *tropic of Capricorn.*[3]

The tropics are at about one fourth the distance from the equator to the poles. The belt of land and water lying between or within the tropics is called the *torrid*[4] *zone.* It includes the greater part of the hot belt.

When the sun is over the equator, the line between daylight and darkness passes through both poles. *See figure 2.*

When the sun is over the tropic of Cancer, the light extends far beyond the north pole, but does not reach the south pole, because only about one half the earth is lighted at once. *See figure 3.*

When the sun is over the tropic of Capricorn, a region all around the south pole is in the light, but the north polar region is in darkness. *See figure 4.*

These figures show that at all times the lines between light and darkness are just as far from the poles as the sun is north or south of the equator. When the sun is over either tropic, the lines between light and darkness must therefore be at about one fourth of the distance from the poles to the equator.

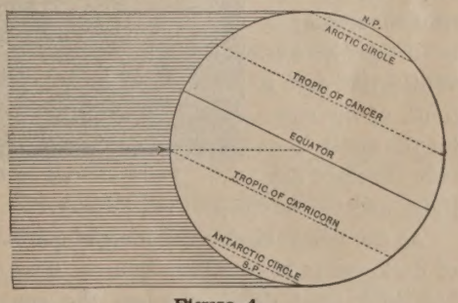


Figure 4.

When the sun is over the equator, every place from pole to pole has twelve hours of day and twelve hours of night. As the earth moves along that part of its orbit which brings the vertical rays farther and farther north of the

[1] Owing to the fact that the sun is not in the center of the earth's orbit, and that the earth does not move at the same rate of speed in all parts of its orbit, the vertical rays fall north of the equator for about 185 days, and south of the equator for about 180 days.

[2] For some purposes, the seasons are divided at the beginning of March, June, September and December. Thus, the average temperature of summer is based on the temperature of the entire months of June, July and August.

[3] The word *tropic* means the *turning* place, and applies to the line over which the sun *seems* to turn backward on its journey. Cancer, the *Crab*, and Capricornus, the *Goat*, are names of groups of stars through which the sun once seemed to pass when over the tropics.

[4] Torrid means *parched;* frigid, *cold;* temperate, *moderate.*

equator, the days in the northern hemisphere become longer and the nights shorter. The farther north a place is, the longer its daylight then lasts.

As the sun shines farther north of the equator, there is a growing cap around the north pole, within which there is no darkness. When the sun is farthest north, the cap of constant daylight is bounded by the *Arctic circle.*

Map of the Zones.

As the earth moves in that part of its orbit which carries the vertical rays away from the tropic of Cancer, the cap of constant daylight in the far north grows smaller, and it finally disappears when the sun crosses the equator.

As the sun moves south of the equator, a cap of constant *darkness* grows around the north pole, while a cap of constant *daylight* around the south pole grows till it reaches the *Antarctic circle.* The Arctic and the Antarctic circles are known as the *polar circles.*

Which of these lines bounds the *north frigid zone?* Which bounds the *south frigid zone?* The frigid zones include almost all parts of the cold belts or cold caps.

What circles bound the *temperate zones?* These zones include most parts of the cool belts and the warm belts.

Thus we see that at the north pole, daylight lasts for six months, or while the sun is north of the equator. During that time the south pole is in darkness. While the sun is south of the equator the south pole is in constant daylight, and the north pole is in darkness.

Ferns growing on Trees, India.

At the polar circles the longest period of light or of darkness is twenty-four hours. The Arctic circle has its longest daylight when the sun is over the tropic of Cancer. When do places on the Antarctic circle have their longest period of light?

Between the Arctic circle and the north pole the longest periods of daylight vary from twenty-four hours to six months. Each place within this circle has continuous light for a day, or for some greater length of time not more than six months. Each place has only one of these long days yearly, but it has also many days, or periods of light, less than twenty-four hours long. The nearer the pole, the longer the great period of daylight lasts.

The south frigid zone has the same number of light and of dark periods as the north frigid zone. The *longest* period of daylight in any place within either of the polar circles lasts during the *longest* period of darkness in some place just as far within the other polar circle.

26. Seasons of the Heat Belts.

The open oceans and the air over them do not warm much in summer nor cool much in winter. The greatest changes in heat take place over wide lands. These heat very quickly in the strong sunshine of the long summer days, and they cool very quickly in the long winter nights. The larger the land area, the more extreme its seasons are.

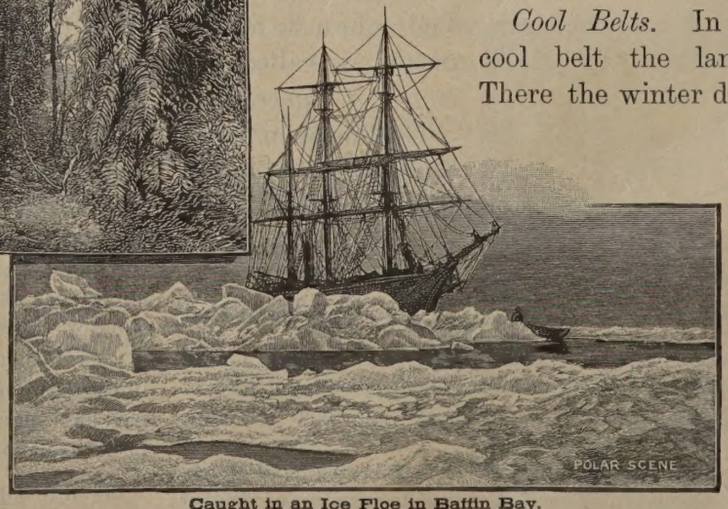
Cold Belts. The seasons in the cold belts are a long and extremely cold winter, and a short cool summer.

During the long winter nights, how cold the air of these belts must become! Ice and snow cover the land and almost all parts of the polar seas. Only a few places in the Arctic ocean are kept open by water drifting from the warmer parts of the Atlantic.

Even during the long daylight of summer, the air of the cold belts cannot become very warm, because snow and ice cover most of the land and sea near the poles and a large part of the sunshine is taken to melt a portion of this snow and ice. The few people living within the northern cold belt are found mostly near the shores past which the warmer waters drift from the south. These people get their food mainly by hunting and fishing, or by tending herds of reindeer. No people live in the southern cold belt.

Brilliant lights, called the *aurora,*[1] sometimes appear in the polar skies, and are also seen from places far beyond the frigid zones. The auroras diminish the darkness of the long polar night.

Cool Belts. In the northern cool belt the lands are wide. There the winter days are short, and the sunshine of that season is slanting and weak. The winters are therefore very cold, especially in the



Caught in an Ice Floe in Baffin Bay.

Eskimo Boy.

[1] The northern lights are called the *aurora borealis.* The southern lights are called the *aurora australis.*

northern half of the belt, where snow covers the ground for several months each year, and where heavy frosts are common in the late spring and the early autumn.

In spring and summer the days of this cool belt are long and the sun's rays are not very slanting, except in the northern part of the belt. The summers thus become very warm, especially in the southern half of the belt.

In the cool belt of the south there is not much land, and the climate therefore changes but little. The air over the oceans remains steadily cool, while over the narrow lands it varies only from warm to cool.

Warm Belts. The lands in the northern warm belt are wide, but the days and nights do not differ greatly in length, and the sun's rays are never very slanting. The winters on the lands are cool but not cold. The summers are very hot. On the northern oceans, both in the cool and the warm belts, the change of seasons is much less than on the lands.

The winters and the summers of the lands in the southern warm belt are well marked, but these lands are small compared with the oceans in the same belt. The change of seasons is greatest on the small land interiors, and least near the coasts and on the oceans.

Hot Belt. In the hot belt the slant of the sunshine varies but little, and the days and nights are always about twelve hours long. There the change of seasons is very slight, and there is no winter. The air is hot nearly all the year.

The line of greatest heat around the earth is called the *heat equator*. It shifts north and south once a year, always towards the places where the sunshine is strongest. The line of greatest heat therefore follows the movement of the sun.

Northern Lights.

of the year, the heat equator moves slowly southward across the same belt.

The heat equator moves farther from the true equator on the lands than on the sea, because the land warms much more quickly than the water.

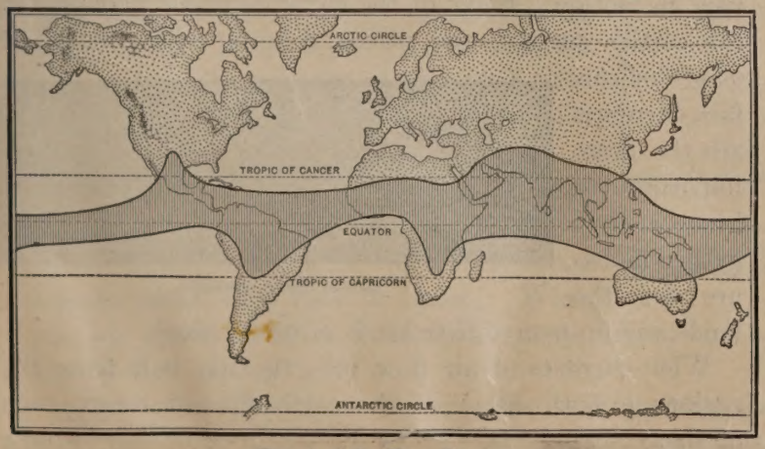
As the heat equator shifts north and south, the weather of all the heat belts shifts with it, back and forth once a year, following the sun.

During our summer, hot weather spreads into the northern warm belt; the warm weather shifts into the cool belt; the cool weather shifts into the cold belt; the cold weather dwindles away and perhaps disappears from the north polar region.

Heat Belts and their Seasons.[1]

The positions of the heat equator in our winter and our summer are shown on this little map. The southern edge of the shaded belt is the heat equator for January. The northern edge is the heat equator for July. Let us not forget that our winter months are the summer months in places south of the hot belt.

During the time between January and July, — the first half of the year, — the heat equator shifts slowly northward, through the entire width of the shaded belt on the map. During the latter half



Range of the Heat Equator.

During our winter, the cold weather of the northern cold belt spreads far southward over the cool belt; the cool weather shifts to the warm belt; and warm weather only is felt at the border of the hot belt.

South of the equator, the opposite changes are meanwhile taking place. When the warmer weather swings northward from the equator, the cooler weather shifts towards that line from regions south of it; but owing to the smallness of the southern lands and the vastness of the oceans, the seasons south of the equator do not present great extremes of heat or cold.

In all the heat belts, the highlands are cooler than the lowlands. Even near the equator, the tops of very high mountains are covered with snow all the year.

[1] Figure 5 shows the plan on which the above map of the *Heat Belts* is made. It is as if the places on the globe were lifted outward, away from the center of the globe, and drawn upon the paper cylinder, which is then cut apart and spread out as in the above map. In such a map, the cold and the cool belts appear much too large, for the polar circles are stretched to the full length of the equator.

Figure 5.

27. Latitude and Longitude.

Every circle, both large and small, may be divided into 360 parts, each of which is called a *degree*.[1]

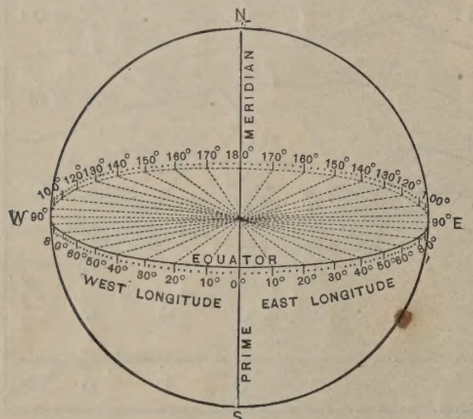
How many degrees are there in one fourth of a circle? In half a circle? In one sixth of a circle?

The distance from the equator to either pole is ninety degrees (90°), or one fourth of a great circle running north and south around the earth. The tropic of Cancer is $23\frac{1}{2}$° north of the equator, and the tropic of Capricorn is just as far south of the equator.

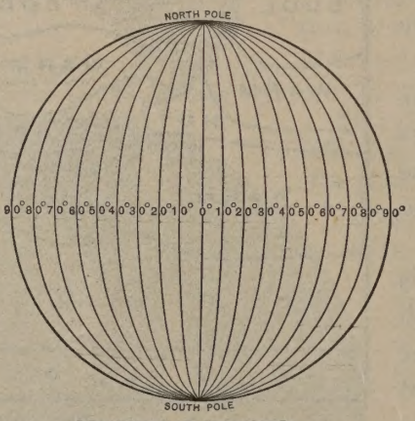
How far are the polar circles from the poles? How far are those circles from the equator?

The tropics and the polar circles are parallel with the equator, and are therefore called *parallels*. We may think of other parallels at 1°, 10°, 30°, or any number of degrees as high as ninety, from the equator.

Parallels show how far places are north or south of the equator. Thus the city of New Orleans is 30° north of the equator,— written 30° N. That city is at one third the distance from the equator to the north pole. *See colored map of North America.* There are many other places on the same parallel, or at the same distance from the equator.



Degrees of Longitude.

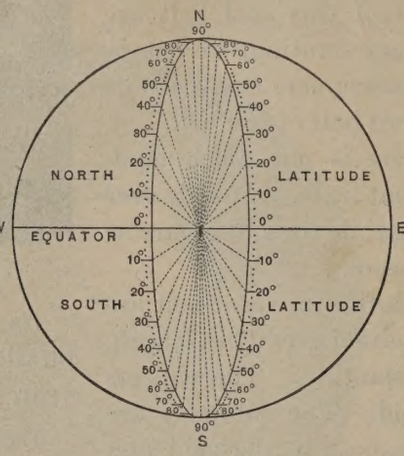


Meridians of Longitude.

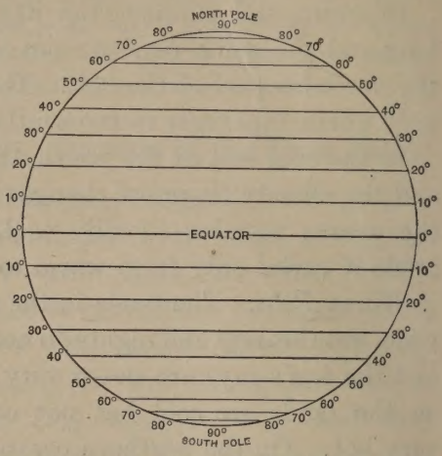
All places on any one of the north-and-south lines running from pole to pole have midday at the same time. These lines are therefore called *meridians*, meaning *midday lines*.

We may think of any number of meridians and number them, beginning with either of them. The line with which the numbering begins is called the *prime* meridian, meaning the *first*.

The prime meridian most commonly used by sailors passes through *Greenwich*, near London. This is known as the *meridian of Greenwich* and is marked 0° on the maps. *See colored map of British Isles.* The meridians which show degrees are generally numbered from 1 to 180 east from Greenwich, and also from 1 to 180 west. These numbers count the degrees around the equator or the parallels.



Degrees of Latitude.



Parallels of Latitude.

New Orleans is on the meridian 90° west of Greenwich,— written 90° W. Knowing both the parallel and the meridian of that city, we may locate it at 90° W. and 30° N.

The number of degrees at which any place lies north or south of the equator is called the *latitude* of that place. The number of degrees at which any place lies east or west of a given prime meridian is called the *longitude* of the place.

Latitude means the *broad way*; *longitude* means the *long way*.

In ancient times, when nearly all the shipping in the world was on the Mediterranean sea, the *long way* was east and west; the *broad way* was north and south.

What is the latitude of New Orleans? What is its longitude? Find out the latitude and longitude of the town or city in which you live.

What is the latitude of the tropics? Of the polar circles?

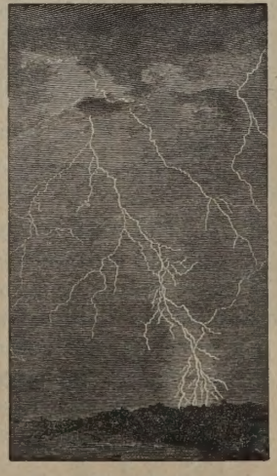
28. Winds and Rainfall.

Winds. Cold air, being heavier than hot air, flows towards and creeps under the hot air, pushing it upwards.

As all parts of the earth are not heated alike, the air is kept in motion. Some of the currents of air move along the earth's surface, and others flow far above it. The *winds*, or surface currents, are the more important to know, as they gather moisture for the lands and do many other kinds of useful work.

Arctic Snow Crystals.

Wide currents of air flow into the hot belt from the regions on both sides. If the earth did not rotate, each of these currents would flow due south or north, towards


Lightning.

[1] A 60th part of a degree is called a *minute*. A 60th part of a minute is called a *second*. Ten degrees, thirty minutes and forty seconds may be written — 10° 30′ 40″.

the heat equator. The turning of the earth on its axis turns these winds westward, so that they flow into the hot belt from the northeast and the southeast.

These winds are called the *trade winds*. On the oceans they are very steady, and blow with little change by day or by night. The trade winds are seldom interrupted by bad weather or storms.

Every wind takes the name of the direction *from* which it blows. The trade winds blow *from* an easterly direction and are therefore called *easterly winds*.

These winds caused great fright among the sailors of Columbus. Day after day the wind moved the ships steadily westward, and the sailors did not see how they could ever return against it. These winds are now helpful to commerce.

Between the northeast and the southeast trade winds there is a narrow belt where the winds are weak and irregular, often dying away to a calm.

This narrow belt of weak winds lies along the heat equator and shifts north and south with it. This belt is the region where the air from the trade winds becomes hottest and lightest and is therefore slowly lifted into the upper atmosphere.

General Plan of the Winds.
(The dotted areas indicate rain.)

Outside the trade wind path, the winds of the warm and the cool belts vary in direction from time to time and are often stormy, but they blow mostly from the west and are therefore called the *westerly winds*.

Between the westerly winds and the trade winds there are weak, irregular winds that generally have dry weather.

The storms of the westerly wind belts are great whirls, or *eddies*, that drift along to the eastward over the sea and the land. In these eddying winds are broad areas of clouds, often yielding rain or snow.

The round map on this page illustrates some of the eddying storms on their way across the cool and the warm belts on both sides of the equator.

In the cold belts, the winds are variable and often stormy. They generally blow in about the same direction as the trade winds, — most frequently from the northeast in the north polar region, and from the southeast in the south polar region. These are called *polar winds*.

Rainfall. When the air is cooled it cannot hold so much vapor as when warmer. When cooled enough, the vapor in it forms clouds, often with rain or snow. When the air grows warmer it can hold more vapor, and no clouds then form in it.

The trade winds blow towards the heat equator and therefore do not give out rainfall unless they are chilled on the way. Lowlands in the path of these winds are generally dry, but the windward sides of highlands in the trade wind belts receive abundant rainfall.[1]

When air rises to cross highlands, it expands and cools. Some of its vapor may then be condensed into clouds which may yield rainfall on the slopes of the highlands.

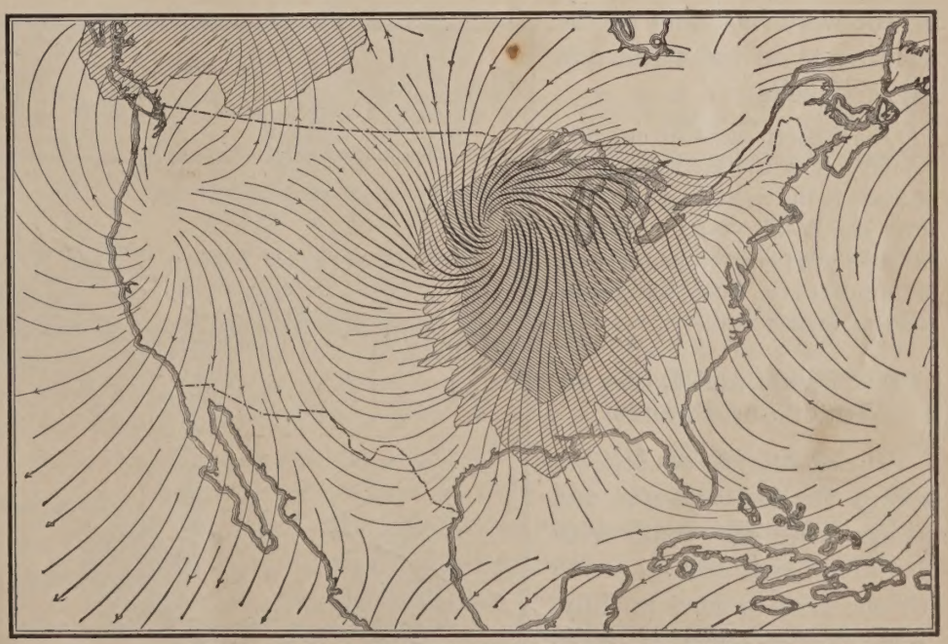
Some of the great deserts in the world are lowlands in the path of the trade winds. In desert regions the winds gather so much dust that the sky is pale-blue or even gray.

There is a very large amount of vapor in the equatorial belt of weak winds, and almost every afternoon or evening, when the warmer air rises most actively, rains pour down, with thunderstorms and squalls. This rainy belt is called the *equatorial rain belt.*

The rains of the equatorial belt *on the land* often occur late at night, as if condensed by the cooling of the tops of the clouds which last over from the afternoon.

So much rain falls in the equatorial rain belt that the surface water of the oceans in this belt is a little less salt than the oceans under the drying trade winds.

On highlands and on windward coasts the rainfall from the storms of the westerly winds is very heavy. Far inland the rainfall is much lighter.



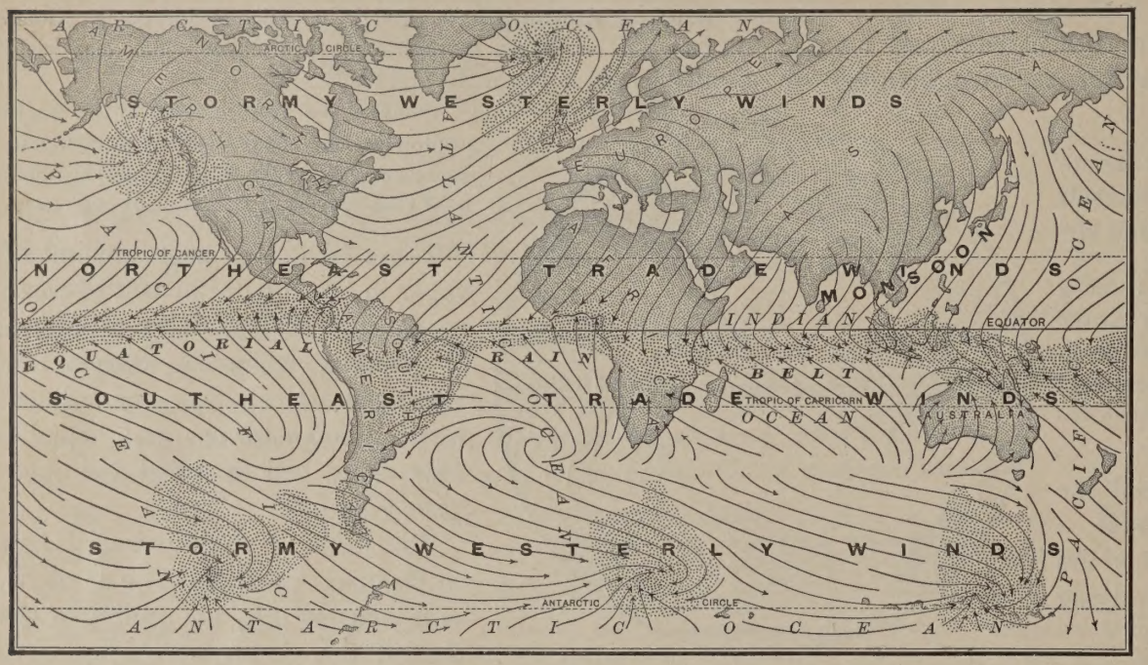
Eddying Storm moving eastward across the United States.

NOTE. — The arrowheads show that the winds are eddying towards the storm center, where the dark shading shows the rain area, and the lighter shading the cloud area. The winds, rains and clouds are whirling eastward. The small map on this page shows several of these storm eddies. See maps on the next page also.

The above map shows a storm eddy crossing our country. As the cloudy and rainy eddy drifts eastward, clear weather follows it.

[1] The term *rainfall* includes rain, snow, hail and all other forms of falling water or ice.

The winds in an eddy whirl faster than the storm center moves forward in its path. Waves caused by the whirling winds run ahead of the storm and often give warning of its approach.



Winds and Rains of January — Northern Winter.

The westerly winds blowing inland from over the oceans are neither hot in summer nor cold in winter. The great bodies of water over which they blow, and from which they get their moisture warmth, have nearly the same temperature both in winter and in summer. The westerly winds, therefore, give an even temperature to the western coasts of the continents in the warm and the cool belts.

The western coast of our own country owes the mildness of its climate to the westerly winds from over the Pacific ocean. Western Europe also has a more even temperature than the inland regions farther east.

29. Winds and Rains of Winter and Summer.

The *equatorial rain belt* lies along the *heat equator* and shifts north and south with it. This rain belt is north of the true equator in July, and mostly south of it in January. When the heat equator and the rain belt move away from a region, the drying trade winds blow there, and a dry season follows a wet season.

Some places on or near the true equator are visited by the rain belt twice each year, — once as it moves north, and again as it goes south. Such places have two wet seasons and two dry seasons yearly.

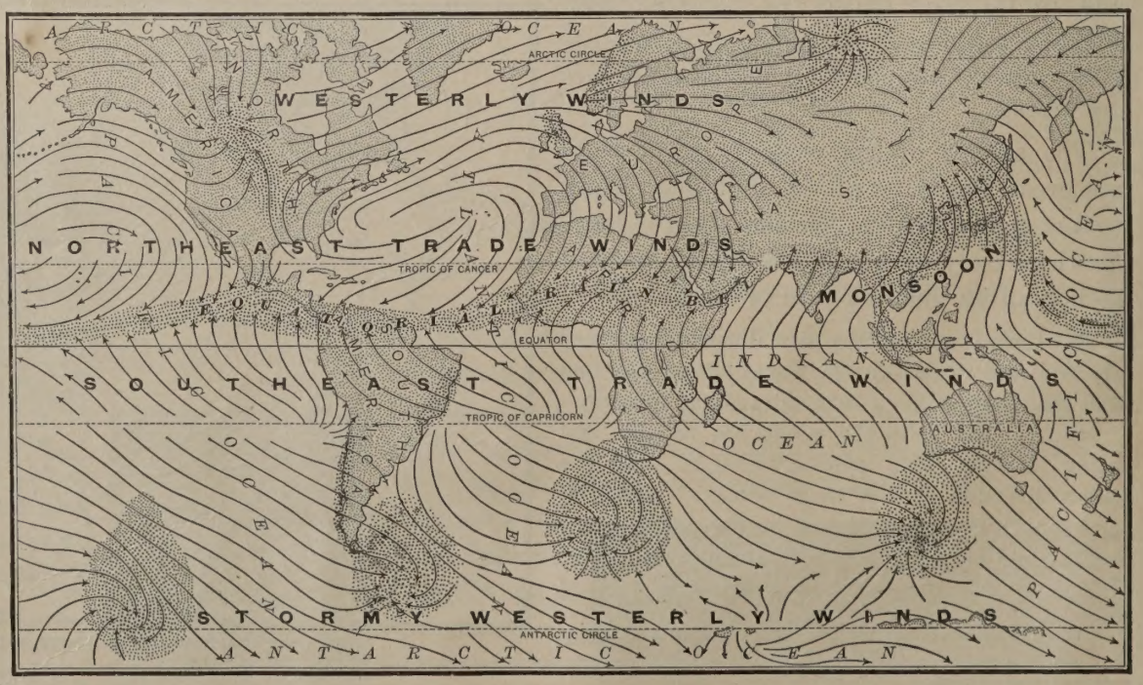
Lowlands that are reached by the equatorial rain belt when it is farthest north or south have a short wet season and a long dry season. Wet weather prevails only while the rain belt is over these places. Dry weather comes when the rain belt moves away and the trade winds prevail.

In the lowlands having the single rainy season each year, grass and flowers grow in abundance while the wet weather lasts, but in the dry months the vegetation withers away. In some places the ground then becomes parched and dry, like a desert.

The trade winds blow towards the heat equator. Where these winds cross the true equator to reach the heat equator, they change their direction, as shown on the maps.

When the heat equator reaches southern Asia, the southeast trade winds cross the equator and flow as southwest winds towards that continent. While the heat equator is in the south, the northeast trade winds blow from Asia, and on crossing the equator become northwest winds, as shown on the above map.

Winds that reverse their direction in opposite seasons are called *monsoons*, or *season winds*.



Winds and Rains of July — Northern Summer.

Since the belts of trade winds shift north and south at about the same time that the heat equator shifts, the outer borders of these belts are farther from the true equator in summer than in winter.

During the northern summer, when the border of the trade wind belt is farthest north, the regions south of the equator have their winter, and therefore the southern border of the trade wind belt is then nearest the equator. As the southern summer approaches, the southern border of the trade wind belt moves away from the equator.

The westerly wind belts shift north and south with the belts of trade winds. As a result, some places feel the steady trade winds in summer and the stormy westerly winds in winter. Such places have dry summers and wet winters.

In winter a large part of the west coast of North America and all the west coast of Europe receive rainfall from the stormy westerly winds. In summer the trade winds extend over the southern parts of these coasts and cause drouths.

Parts of the west coasts of the three southern continents have similar changes from winter to summer.

The westerly winds and their storm eddies are strongest in the winter season. That is the time when the coasts and the mountains on which they blow receive the most rainfall,—rain or snow. The western coast lands of continents in the cool and the warm belts, therefore, have their heaviest rainfall in winter.

During the summer season, the westerly winds are less active and their storms are weaker and fewer.

In winter the air over the northern continents is cold and heavy.[1] In that season, therefore, the winds from over the sea do not reach the interior of the continents so easily as in summer when the air over the land is warm and light. For this reason, the interior regions of the northern continents receive their rainfall chiefly in summer.

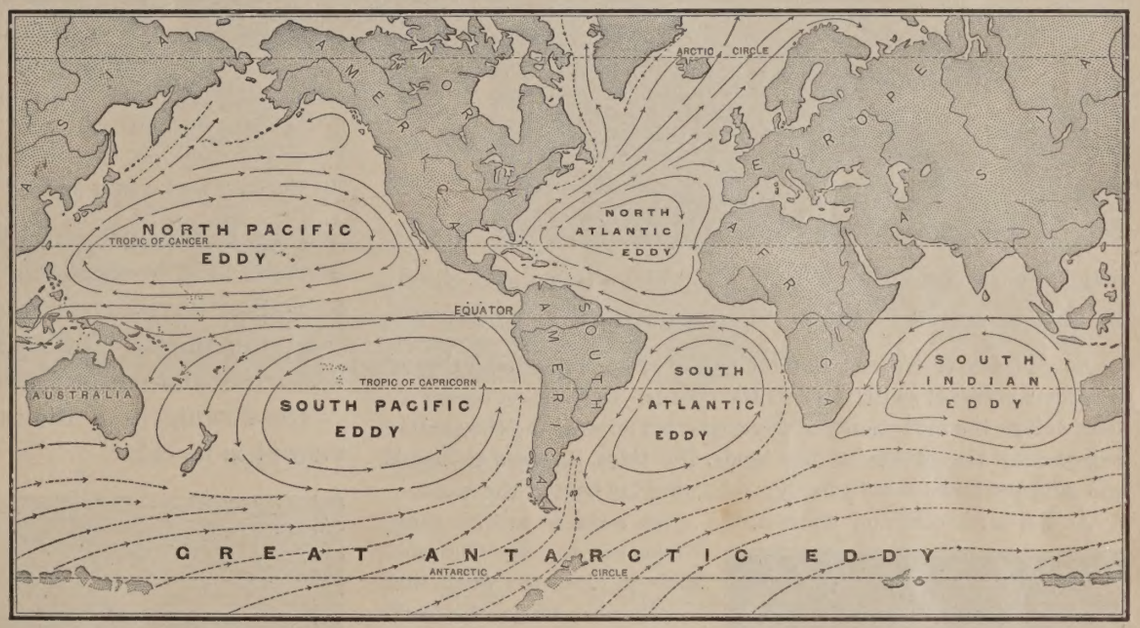


Chart of the Ocean Currents.

30. Ocean Currents.

Winds blowing day after day for a long time against waves in the sea cause the surface water to drift slowly along and thus form *ocean currents*. These currents move much more slowly than the winds or the waves.

In each ocean the currents move in the general direction of the winds over them. The trade winds blow the ocean currents westward, and the westerly winds blow them eastward. The lands prevent the currents from moving round and round the earth and require them to circle around, or eddy, in each ocean.

The Atlantic and Pacific oceans have eddies both north and south of the equator. The Indian ocean has a large eddy south of the equator, but the ocean currents north of the equator flow back and forth with the season winds, or monsoons, which prevail over that ocean.

The ocean eddies north of the equator move slowly in the direction in which the hands of a clock turn. The ocean eddies south of the equator move in the opposite direction, or against the hands of a clock.

In the southern cool belt the oceans spread all the way round the earth. There the drifting waters on the southern sides of the Pacific, Atlantic and Indian eddies unite to form a great current sweeping slowly towards the east. This current flows entirely around the Antarctic ocean and may be called the *Antarctic eddy*. It receives cold water from the south polar ocean.

Ocean currents that move slowly over a broad surface are called *drift currents*. These seldom flow more than a mile an hour. Currents that are driven through narrow passages may move three or even four miles an hour. These rapid currents are called *streams*.

Part of the water of the North Atlantic eddy flows between the island of Cuba and the mainland of North America. The current issuing from this passage is called the *Gulf stream*. Joining the rest of the eddy, the Gulf stream spreads as a broad drift far to the northeast. Part of this drift turns back southward into the hot belt, and part branches towards the Arctic ocean.

The large branch of the North Atlantic eddy which runs northeastward into the Arctic ocean bears much warmth to it. A cold current from the Arctic ocean flows southward along the northeast coast of North America.

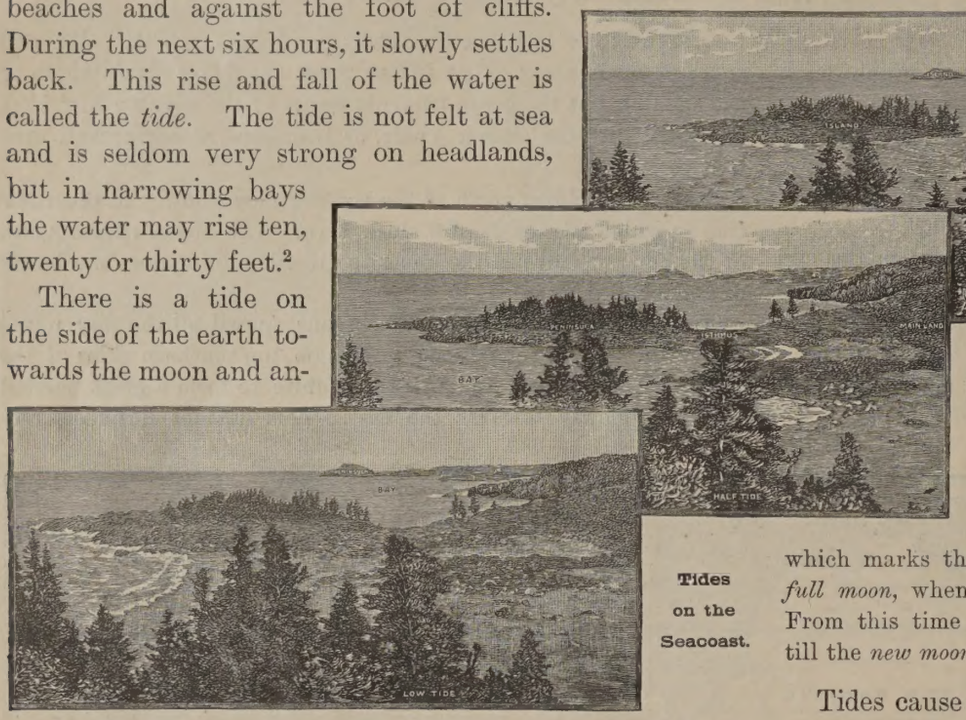
As we study the different continents we shall learn of other currents that warm or cool the air flowing towards the land.

[1] The places of greatest cold in winter are not over the Arctic ocean, but at some distance southward from the Arctic coasts of Asia and North America. In that season therefore the polar winds do not flow inland over the continents, to any great extent, but are pushed out from the lands. In summer, when the inland regions are very warm and when the air over them is light, the polar winds reach farthest into the northern lands.

31. The Moon and the Tides.

Twice each day,[1] the ocean slowly rises and falls on its shores. For about six hours, the water creeps up the beaches and against the foot of cliffs. During the next six hours, it slowly settles back. This rise and fall of the water is called the *tide*. The tide is not felt at sea and is seldom very strong on headlands, but in narrowing bays the water may rise ten, twenty or thirty feet.[2]

There is a tide on the side of the earth towards the moon and another on the opposite side. The tides are caused chiefly by the attraction of the moon, but partly also by the sun.



Tides on the Seacoast.

At all times there are two faint bulges of high tides whose broad wave-forms travel swiftly across the oceans. In the open oceans the tides follow the movements of the moon, but on reaching the shallow waters near the margin of the lands, the tides increase in height and advance much more slowly, — lagging far behind the moon.

As the earth turns on its axis, the moon *seems* to revolve round it from east to west. The moon holds in place the great tidal wave-forms, while the earth turns on its axis. Thus, it is the turning of the earth which makes the two tides appear *daily*, just as it makes the sun rise and set.

The Crescent Moon.

If you will note the time of the moon's setting, you will find that it is nearly an hour later each day, showing that the moon's position is farther east each successive night at a given hour, and that the earth must rotate almost an hour longer than a day, in order to make the moon set. This is the reason why the tides are nearly an hour later each day.

The moon goes round the earth from west to east in about a month. The long diagram on this page shows the path of the earth and the moon for nearly one month, on their way round the sun. The larger circles, half light and half dark, indicate the position of the earth each day; while the smaller circles indicate the position of the moon. The days of the month are numbered, — 1, 2, 3, etc.

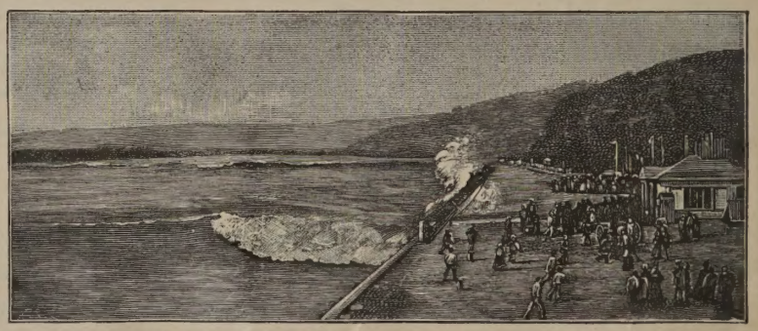
The groups of arrows pointing downward represent the sun's rays and show why the upper sides of the earth and the moon in the diagram are light. At the outset, the dark face of the *new moon* is turned towards the earth.

The little arrow flying upwards between days 7 and 8 shows the point where one half of the light side of the moon may be seen from the earth.

The arrow pointing upwards near the figure which marks the end of the fifteenth day, shows the position of *full moon*, when all the light side is turned towards the earth. From this time on, the moon shows less and less of its light side, till the *new moon* again appears.

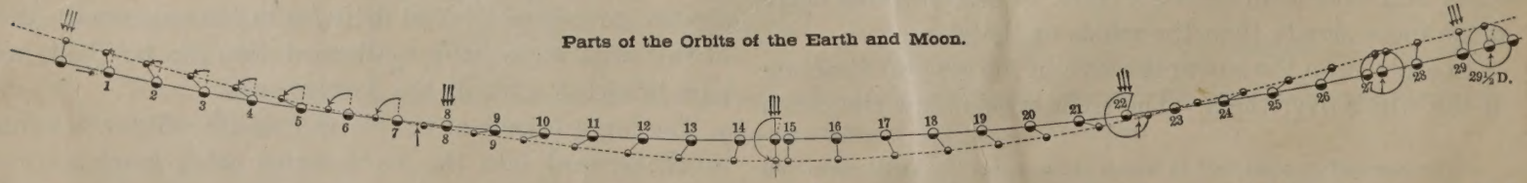
Tides cause currents to flow in and out of bays. Tidal currents help to scour the mud and sand from the bottom of shallow bays and to wash the rock waste farther away from the shores. Twice a day these currents carry sea water into and out of the bays and thus keep them pure.

The flowing in of the tide is called its *flood;* the flowing out is its *ebb*.



The Bore or Tidal Wave (Seine River, France).

It is important to know when high or low tides occur in different harbors, for the tidal currents are of great assistance to vessels sailing in or out. At the mouths of some harbors the water at low tide is not deep enough for vessels to enter. They must then wait for the high tide.



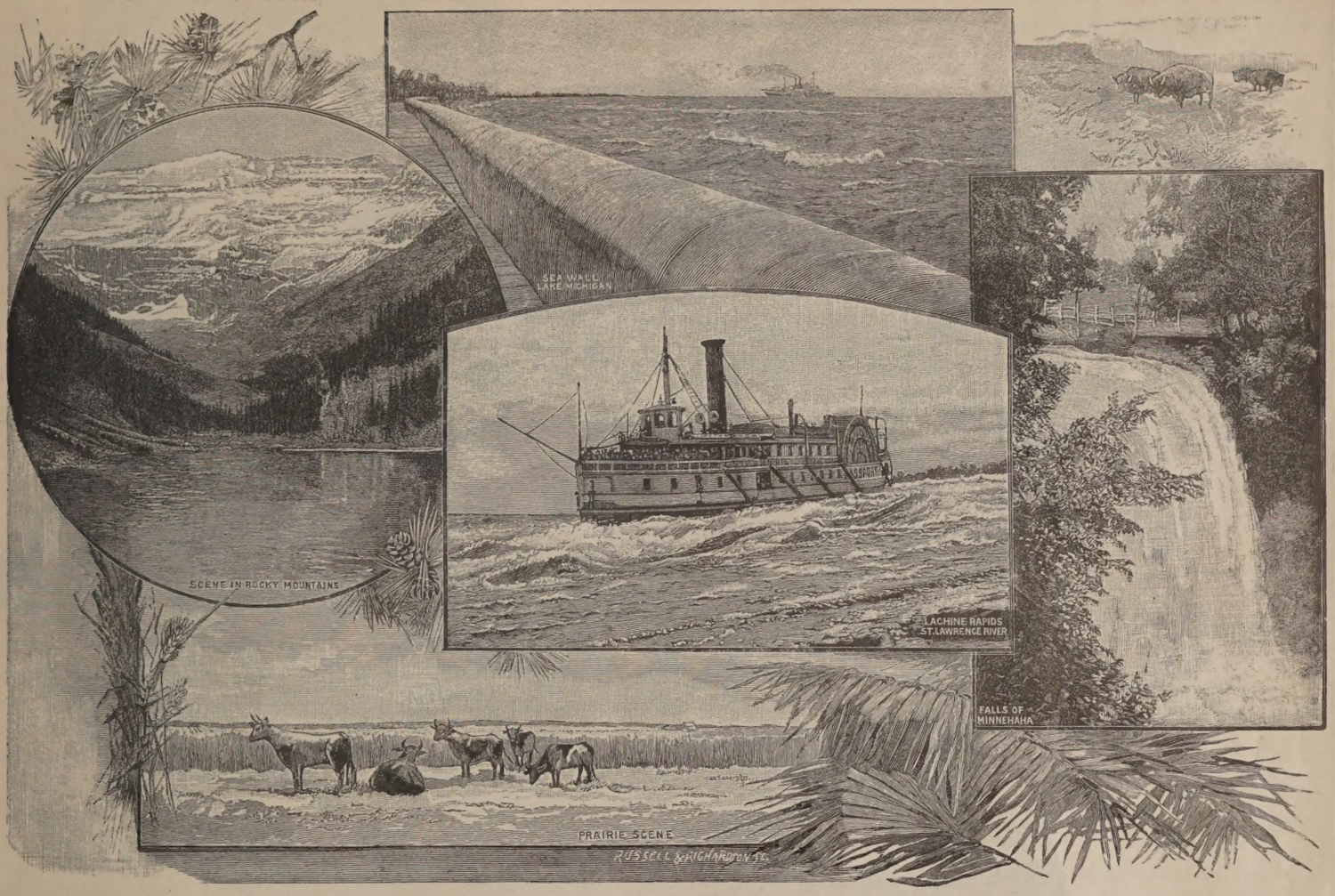
Parts of the Orbits of the Earth and Moon.

[1] More exactly, in 24 hours and 50 minutes.

Some places have but one tide a day, and others have more than two tides in that time.

[2] In rare cases it rises sixty feet.

In some narrowing bays and river mouths, the tide forms a high wave followed by several smaller waves. These roll in with great speed and often do much damage. Such a wave formed by the tide is called a *bore*.



NORTH AMERICA.

32. North America.[1]

North America is broad in the north, but it tapers towards the south. This continent covers nearly one twentieth of the earth's surface.[2]

North America consists mainly of a great western highland, a lesser eastern highland and a central plain.

This continent crosses the warm and cool belts, and also enters the cold belt on the north and the hot belt on the south. Only a small part of the continent is in the hot or the cold regions. Far the greater part is in the belts having cold or cool winters and warm or hot summers.

In the warm belt the winter is short and mild, but northward the cold season lengthens, till near the Arctic coast there are only a few weeks of mild weather each summer. The extreme north of the continent is cold and dreary.

Only the southernmost part of North America is reached in summer by the equatorial rains. The highland of Mexico receives rains from the trade winds on its eastern slopes, but the western slopes are not well-watered. The wide middle portion of the continent is in the path of the eddying storms of the westerly winds.

The westerly winds from over the North Pacific eddy give a mild and even climate to the greater part of the west coast of North America, for the seasons over the broad ocean do not change so much as over the land.

In the interior of the continent, far from the sea, the summers are very warm and the winters very cold. There the change of seasons is much greater than near the coast.

On the east coast the winter weather is mild when the southeast wind blows from over the Gulf stream, but is very chilling when the northeast wind from over the Arctic current reaches the land or when cold air flows out from the interior of the continent.

When the cold heavy air of winter covers the interior of North America, not much moist air can flow in, and the inland rainfall is therefore not heavy. When the warm light air of summer spreads over the interior, the moist winds from the sea flow inland and give plentiful rains, except on the lowlands among the western mountains and on the plains along the eastern base of the Rocky mountains.

[1] The *Map Studies* on page 29 are to precede this lesson. Refer often to the relief maps. Locate every place named in the text.

[2] The area of the earth's surface is about *200,000,000* square miles,—more exactly, 197,000,000.

RELIEF MAP OF NORTH AMERICA.

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33. Map Studies.[1]

On the relief map of North America locate the place where you live. *See opposite page.*

What oceans border on North America? What continent adjoins it on the south? In what direction is Europe from North America? Which part of our continent lies nearest Asia?

Turn to the map of the heat belts and tell what you can about the seasons in North America. *See map on page 21.*

Which part of North America is in the path of the westerly winds? Of the trade winds? *See maps on page 24.*

In what direction does the Rocky mountain highland extend? Along which side of the continent does it lie? Which part of this highland looks the highest? The widest?

Into what gulf does the Colorado river flow? Name a large river flowing into Bering sea.

Where is the Appalachian highland? In what direction does it extend? Is it higher or lower than the Rocky mountain highland? Is it longer or shorter? Wider or narrower?

On which side of the Rocky mountains are there vast plains? Name the largest river flowing into the gulf of Mexico. What highlands are on the east and west sides of the Mississippi basin? Which part of the central plain is drained by the Mississippi river and its branches?

[1] For drawing and modeling, see *guide map* in the *Supplement.*

What river forms the outlet of the Great Lakes? What highlands are separated by the valley of this river?

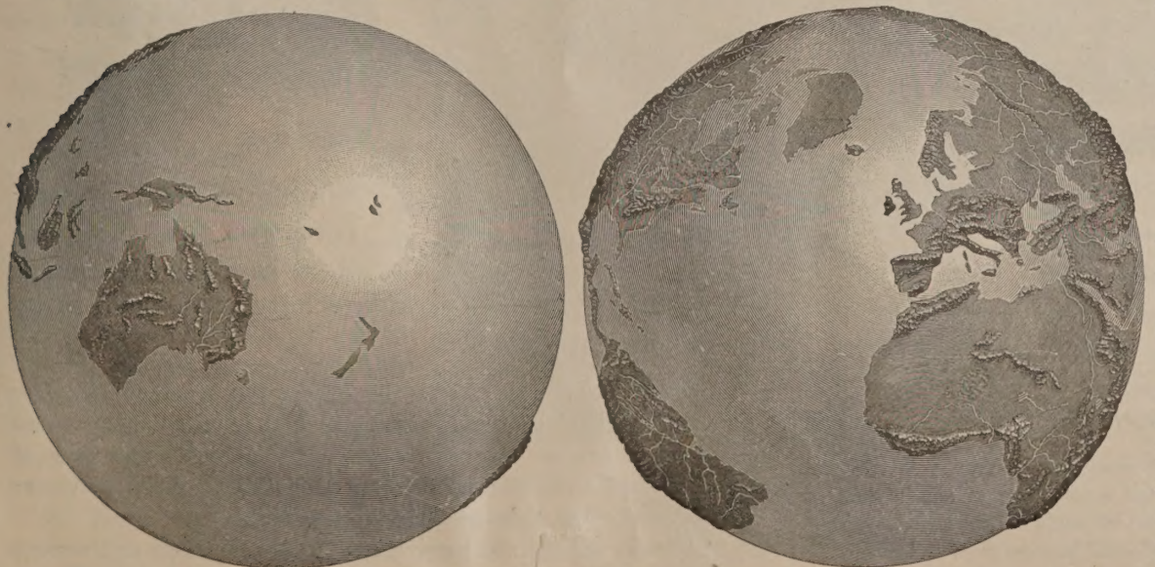
Which portion of the central plain is in the basin of the Nelson river? Into what bay does this river flow?

Describe the course of the Mackenzie river. Which part of the central plain does it drain?

What bodies of water partly surround the peninsula of Florida? The peninsula of Labrador? The peninsula of Alaska? The peninsula of Lower California?

Sketch the general outline of North America,—using only three straight lines. In what general direction does the east coast extend? The west coast? The north coast? Which coast is the longest?

Draw the north coast of this continent; the west coast; the east coast. Which is the most irregular?



Maps showing the Position of North America among the Continents and Oceans.

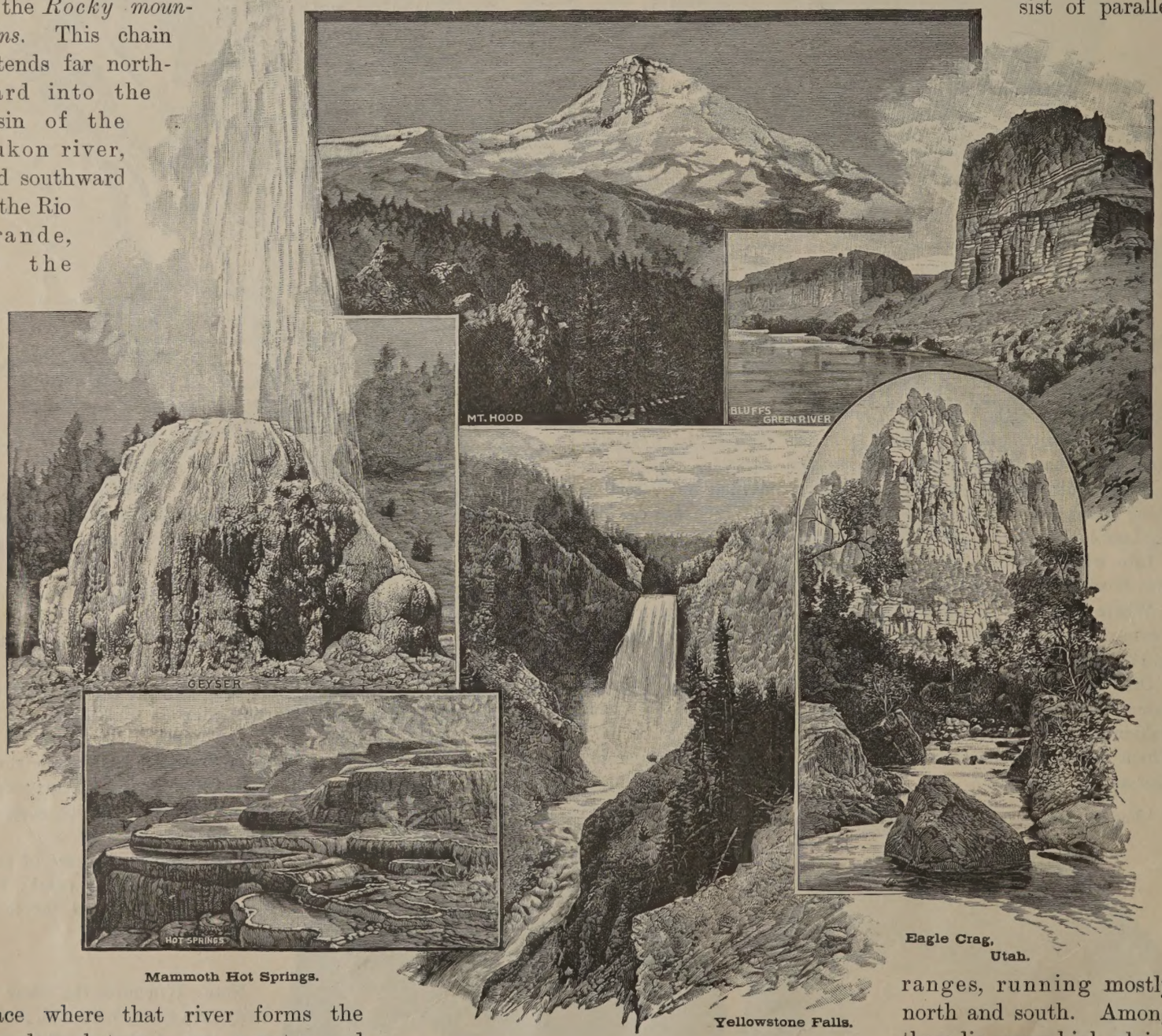
Note: Whenever the name of a city or a country is used, locate it at once on the *colored* map of the continent which is being studied.

All places named in the text can be found either on the *key maps* or on the simple colored maps in the *body of the book.* The maps in the *Supplement* probably contain the names of all places to which you will need to refer in any part of your school work.

34. The Rocky Mountains.[1]

The widest part of the Rocky mountain highland is about midway between the isthmus of Panama and Bering strait.

In this broad portion, lofty ranges almost inclose a vast plateau, about a mile above sea level and several hundred miles wide. The various ranges lying along the eastern side of this plateau are known as the *Rocky mountains*. This chain extends far northward into the basin of the Yukon river, and southward to the Rio Grande, at the place where that river forms the boundary between our country and Mexico.



Mammoth Hot Springs.

Yellowstone Falls.

Eagle Crag, Utah.

In the Rocky mountains, as in all high mountains, bare crags stand out near the summits, and coarse stony waste creeps down the slopes into the valleys. The finer waste is washed farther and is spread over the lower land. The plains along the eastern base of the Rocky mountains are made of the waste which in past ages has been washed from the great range. Many of the Rocky mountain peaks are over two miles and a half high.

Where are the Laramie plains? *See map on page 32.* These plains are in a high plateau region that interrupts the Rocky mountain chain. The route of the first railroad built across our country leads over the Laramie plains.

South of the Laramie plains the Rocky mountains consist of parallel ranges, running mostly north and south. Among these lie many high plains known as *parks*. The parks are lofty basins shut in by ranges on nearly all sides.

Among these are the *North*, the *Middle*, the *South*, and the *San Luis* parks. Each of these contains several hundred square miles of land that is quite level and is covered with rock-layers made of waste washed from the surrounding mountains. Some parts are wooded, and other parts are grassy or rocky.

The parks are drained by rivers that have cut deep and narrow valleys, or *canyons*, through the ranges. The sources of the Platte,

[1] The surface of the United States, occupying a broad belt across the middle part of North America, is treated much more at length than any other part of the earth, not only because we ought to know the geography of our own country, but also because the full knowledge of the surface and resources of our land affords the best key to its history.

the Arkansas, the Colorado and the Rio Grande are in this park region. Railroads through this rough country often follow the canyons, but the wagon roads generally lead over the passes in the mountains.

Among the famous mountains of this region are Pikes peak and Longs peak. These rocky masses, patched with snow, may be clearly seen from the plains on the east of the great chain.

The Wasatch range rises along the western part of the Rocky mountains. The Colorado river receives streams from the east slope of the Wasatch range.

From the region of the Laramie plains the Rocky mountains bend towards the northwest and there the great western highland of the continent becomes narrower.

Where is the Wind River range? This high range contains sources of streams that belong in three large river systems, — the Colorado, the Columbia and the Mississippi.

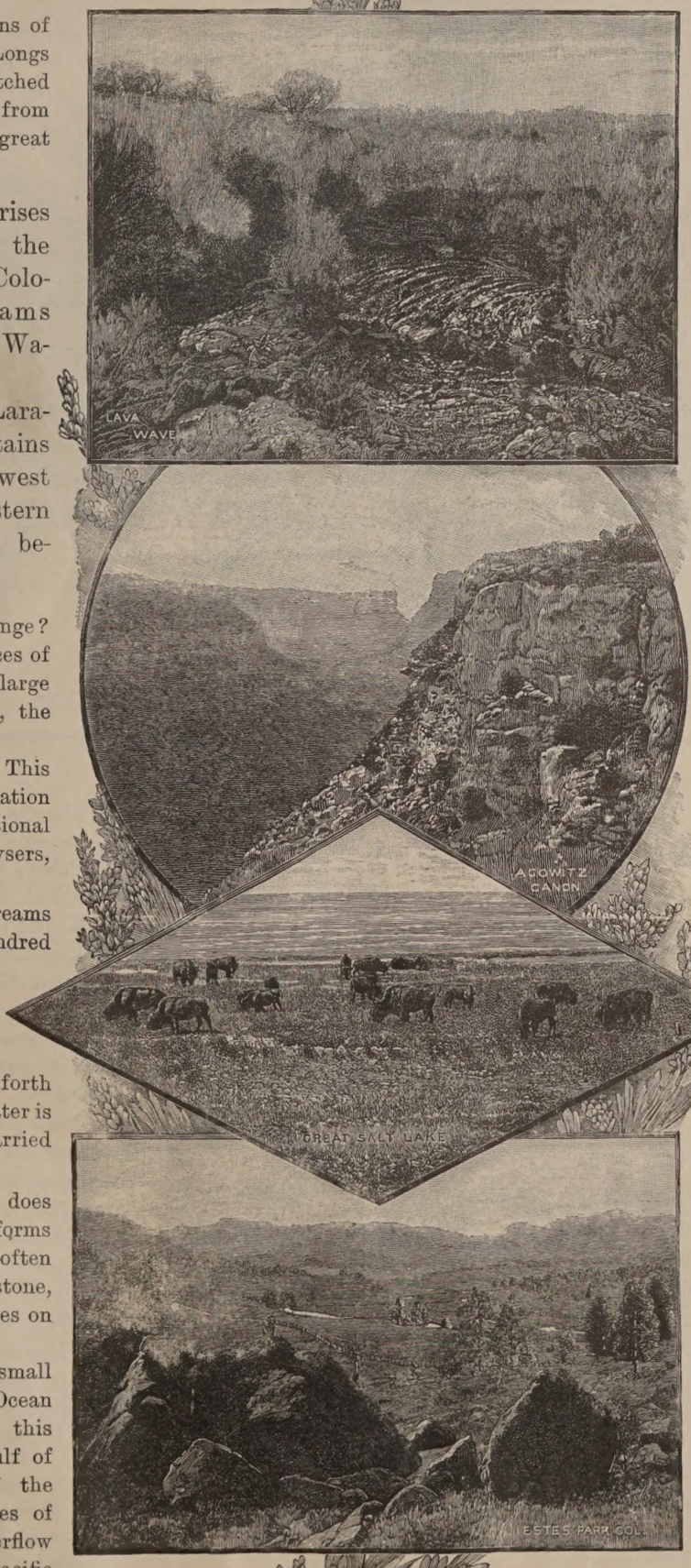
Locate the Yellowstone park. This park has been reserved for the nation and is therefore called a "national park." It is famous for its geysers, hot springs, falls and canyons.

Some of the geysers throw streams of hot water more than two hundred feet into the air. Steam escapes with loud roaring and makes the ground tremble. The water in some of these fountains falls back into basins, to be belched forth again. In other geysers the water is broken into fine spray and is carried away by the wind.

In many basins the water does not spout but only rises and forms pools, or hot springs. These often overflow and make terraces of stone, like those in one of the pictures on the opposite page.

In Yellowstone park is a small body of water known as Two-Ocean pond. In ordinary weather this pond finds an outlet to the gulf of Mexico, through branches of the Mississippi river; but in times of heavy rains, part of the overflow from the pond reaches the Pacific ocean, by way of the Snake and Columbia rivers.

Two-Ocean pond is on the *continental divide*, — the divide between the slopes which descend to the Atlantic ocean and the Pacific.



Sagebrush.

The rainfall is not very heavy on those parts of the Rocky mountains which are in the United States, because the great chain lies far away from the sea, and much of the moisture brought by the eddying storms of the westerly winds from over the Pacific ocean falls on high ranges near the Pacific coast.

The rainfall in the Rocky mountains, as in other parts of the earth, is heavier on the ranges than on the neighboring lower lands. Streams from the mountains feed many of the rivers, and canals from these are often led out to water the plains.

In summer, thunderstorms sometimes start over the high mountains and drift eastward, watering the plains east of the ranges. Snow often falls on the mountains, while rain is falling on the lower lands.

Only small parts of the Rocky mountains are forest-clad, but even this light supply is valuable, because the lower lands of this region are almost treeless, on account of the dryness.

This deep-worn highland yields more silver ore than any other part of our country.

Gold is another valuable product. The city of Denver has had very rapid growth because it is in the midst of a great grazing country on the plains and is near rich mines in the mountains.

Northward from the border of the United States, the Rocky mountains are not very far from the Pacific coast, and therefore receive plentiful rainfall. For a great distance the range is still lofty. Its summits are heavily snow-clad, and large glaciers are found on its slopes. The mountains, as well as the lower parts of the highland, are heavily wooded.

Owing to the vegetation on the slopes of the Rocky mountains in Canada, ore-bearing rocks are not so easily found there as in our own country.

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Key to Relief Map on pages 34 and 35.[1]

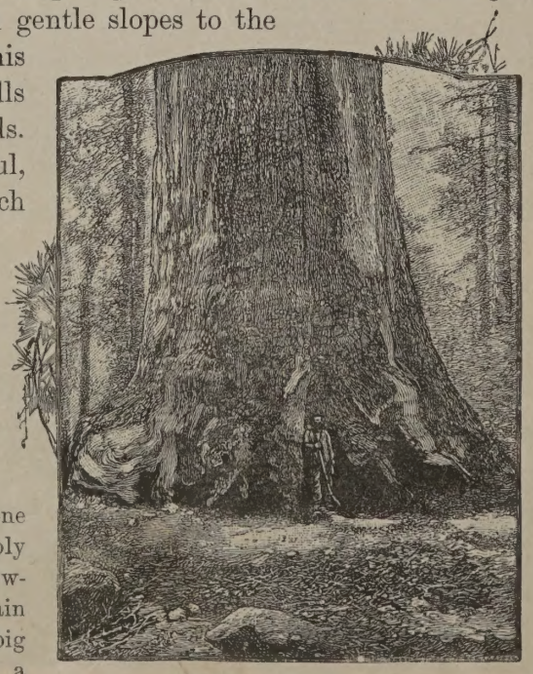
35. The Sierra Nevada.

Where are the mountains that form the *Sierra Nevada?* This name means *snowy range.*

The lofty Sierra Nevada rises in steep slopes from the plateau on the east, but descends in gentle slopes to the low valley plain on the west. This range receives heavy winter snowfalls from the storms of the westerly winds. In summer, the rains are not plentiful, because the trade winds then reach farther north, and storms are fewer. The summer streams from the Sierra are fed by the melting snow.

The broad uplands of the west slope of the range are heavily wooded. The east slope is drier, and its forests are therefore lighter.

Most of the Sierra forests consist of cone trees, — pine, spruce and fir. They supply lumber to the cities and towns in the lowlands west of the range. On the mountain slopes are found groups of the famous "big trees." Some of these are more than a thousand years old and have a height of over three hundred feet. They are the largest trees known in the world. Mt. Whitney, near the southern end of the range, is higher than any peak of the Rocky mountains in the United States.



California "Big Tree."

Ages ago the Sierra Nevada was greatly worn down. When the surface reached the deeply-buried layers, veins of rock containing gold were then uncovered. There were grains and nuggets of gold in the waste which was washed from the mountains and which formed beds of gravel along their western base.

In that ancient time, volcanoes among the mountains poured forth lava that flowed down the valleys and buried the gravel of the river beds. In the ages which have since passed, the mountain region has again been uplifted and the volcanoes and the lava-flows have been greatly worn away. New valleys have been cut, and in many places the gold-bearing gravel under the lava has been laid bare. The gravel beds are now dug out for the gold which they contain.

The picture on page 140 shows how miners sometimes use water to wash down a gravel bed. The water forces the gravel down a trough, across the bottom of which are small cleats or grooves holding quicksilver. The gold is gathered by the quicksilver, and the gravel is washed away.

[1] Key to figures and letters on the map: The heights of peaks are given in the *Supplement.*

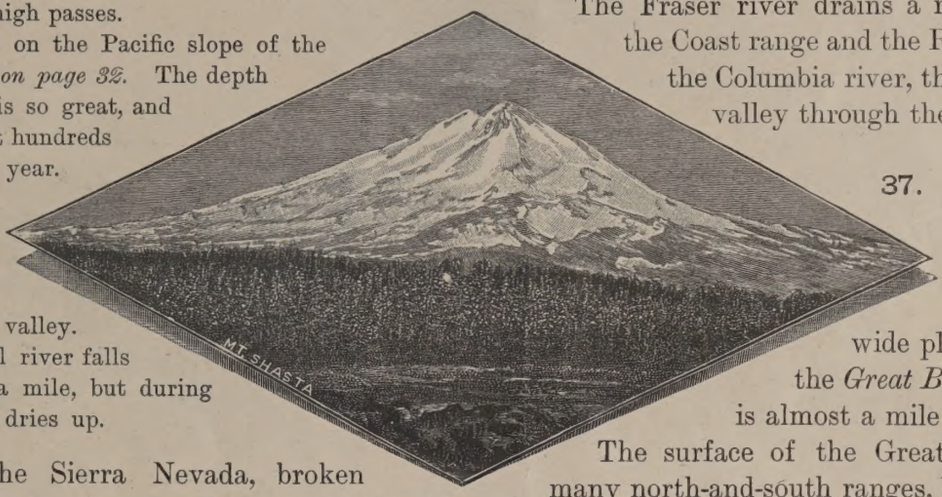
1. Yellowstone Park.
2. North Park.
3. Middle Park.
4. South Park.
5. San Luis Park.

D = Death Valley.
H = Mt. Hood.
J = Mt. Whitney.
L = Longs Peak.
M = Mitchells Peak.
P = Pikes Peak.
R = Mt. Rainier.
S = Mt. Shasta.
F = Mt. San Francisco.
Y = Yosemite Valley.

The lava-flows blocked many river valleys and thus formed lakes. In time, many of these were drained and their beds became meadows, making the best farming lands now to be found among the mountains. One river has cut a deep valley from east to west across the northern part of the Sierra Nevada. Elsewhere the range can be crossed only over high passes.

The Yosemite valley is on the Pacific slope of the Sierra Nevada. *See map on page 32.* The depth of this wonderful valley is so great, and its sides are so steep, that hundreds of people visit it every year.

In some places, its steep sides are about half a mile in height. Beautiful streams from the upland leap over cliffs into the valley. In wet seasons, one small river falls more than a fourth of a mile, but during summer drouths it often dries up.



Southward from the Sierra Nevada, broken ranges extend into the peninsula of Lower California. This peninsula is in the dry belt along the outer border of the trade winds and is too far south to feel the westerly storms, even in winter.

36. The Cascade Range.

From the great volcanic cone of Mt. Shasta, the Cascade range extends far northward. As a whole, it is not so high as the Sierra Nevada.

A large part of the Cascade range is built of lava, and the highest peaks in this range are volcanoes. The sides of most of them are deeply worn, showing that a long time has passed since their lava flowed. Some of the peaks bear large glaciers. Mt. Hood is one of the highest.

In recent years a few peaks in the Cascade range have sent out small jets of steam, and at least two craters have given forth showers of ashes, but no lava-flow has been known to take place since white men first went to the region. The lava on some peaks is very firm and has flowed so recently that it has hardly begun to weather.

At the place where the Columbia river breaks through the Cascade range, the stream has cut a gorge down almost to sea level, draining the interior country where there was once a large lake. This deep gorge lays bare the edges of many lava sheets and shows them to be very thick.

Rapids break the flow of the Columbia river, at the place where it passes through the range. By means of canal locks, river steamers and other crafts can now pass these rapids.

The Cascade range is so far north that even in summer the trade winds do not reach it. The storms of the westerly winds reach this range at all seasons, but the winter is the time of heaviest rainfall, as on all other coast regions in the path of the westerly winds. The mountains are covered with forests of valuable timber.

The Fraser river drains a rugged region between the Coast range and the Rocky mountains. Like the Columbia river, the Fraser has cut a deep valley through the Coast range.

37. The Great Basin.

Between the Wasatch range and the Sierra Nevada lies a wide plateau region known as the *Great Basin*. The central part is almost a mile higher than sea level.

The surface of the Great Basin is broken by many north-and-south ranges, between which lie long *troughs* not many miles in width. The region is dry, because the high Sierra Nevada lies along its windward side.

There is more rain on the mountains than in the troughs, and streams have carved many valleys in the steep slopes of the ranges. The rock waste has been washed into the troughs, making gravelly and sandy plains. *See picture at the bottom of page 36.*

The rainfall being light, many of the mountain ranges are bare of trees, and the plains are almost deserts. In these plains, there are shallow hollows, or *sinks*. Winter rains flood the sinks and thus form lakes, but summer drouths cause the lakes to shrink. Some of the places covered by lakes in winter are smooth dry plains in summer. In these desert plains, the wind drifts the sand into dunes which often cover the surface for many miles.

Yosemite Valley, California.

The streams of the Great Basin dry up on the plains or enter lakes from which the water evaporates, for there is not enough water to overflow and cut valleys in the slopes to the sea.

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RELIEF MAP OF THE UNITED STATES.

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Great Salt Lake, Utah.

The plains in the Great Basin are so dry that they are seldom covered with grass, except along the streams running from the mountains. Canals have been made to lead water from these streams to irrigate parts of the plains. A few cities and towns have grown up along the streams and canals.

Some of the deep-worn ranges in this region have rich mines of gold and of silver ore. These have led to the building of other small cities and towns, but the Basin region is only thinly settled.

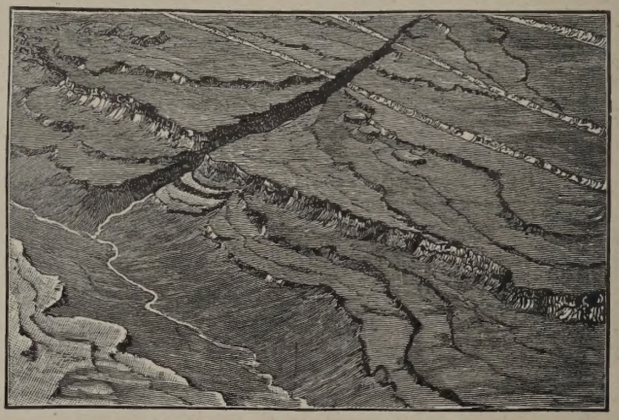
The streams of this region, like nearly all other streams on the earth, wash salt from the soil. The salt is formed by the weathering of certain kinds of rocks. The amount of salt carried by a river during an entire season may be very small, but if the river flows for ages into a basin having no outlet, much salt gathers there. Water standing in such a basin forms a salt lake.

There are many salty valleys and salt lakes in the Great Basin. One of these, Great Salt lake, covers about two thousand six hundred square miles. This lake widens in rainy weather and shrinks in time of drouth. A cupful of its water contains a tablespoonful of salt, — more than four times the quantity in a cupful of ocean water. Salt Lake City, the largest city in the Great Basin, is near the shore of this lake.

Many centuries ago, when there was a wetter climate, a much larger body of water filled the basin in which Great Salt lake lies. The old lake then overflowed northward at the lowest pass in the enclosing mountains and discharged to a branch of the Columbia river. The old shore lines may still be seen on the mountain sides, nearly 1000 feet above the level of Great Salt lake.

In what direction does the Humboldt river flow? This is one of the streams which run into sinks and form salt lakes. The first railroad built across the continent follows the Humboldt river past the ends of about fifteen ranges.

In the low southwest part of the Great Basin, there is a sink that dips below the level of the sea. This is known as *Death Valley* and is noted for its dryness and its intense summer heat. Still farther south lies the Mohave desert, stretching from the Sierra Nevada to the Colorado river.

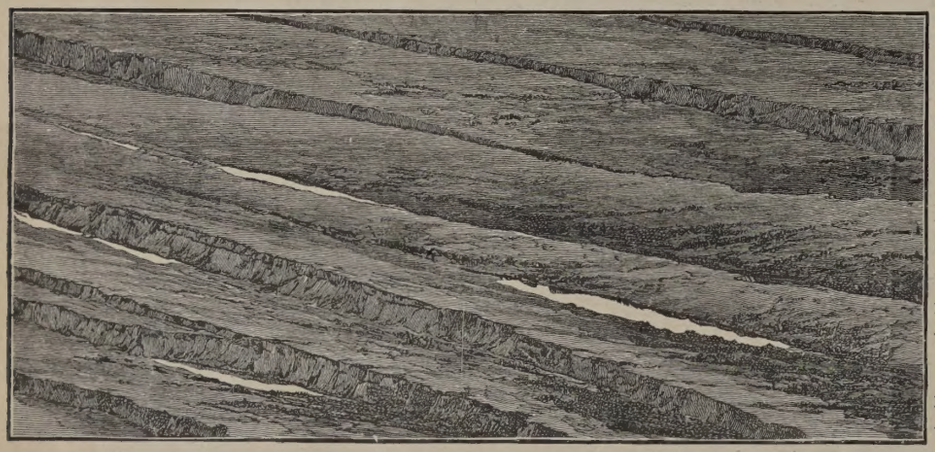


Colorado Plateau Region (page 37).

A region extending northward from the gulf of California was once covered by that body of water, but was cut off by the delta of the Colorado river. The region being very dry, the water in the old head of the gulf has long since dried away, leaving a desert plain. Sometimes a distributary from the Colorado river flows into the hollow and forms a temporary lake.

The Basin region includes not only the Great Basin, but also two smaller districts that are partly drained to the sea. One of these is southeast, and the other northwest, of the Great Basin. On the map (*page 32*) they are separated from the rest of the Basin region by lightly-dotted lines.

In the northwest part of the Basin region, the mountains are so young that no deep valleys are yet worn in their sides. These mountains are edges of huge blocks, tilted like those shown in the picture. The shape of the blocks has hardly changed since the region was thus broken up. Lakes lie in the troughs between the tilted blocks. Most of the lakes have no overflow to the sea.



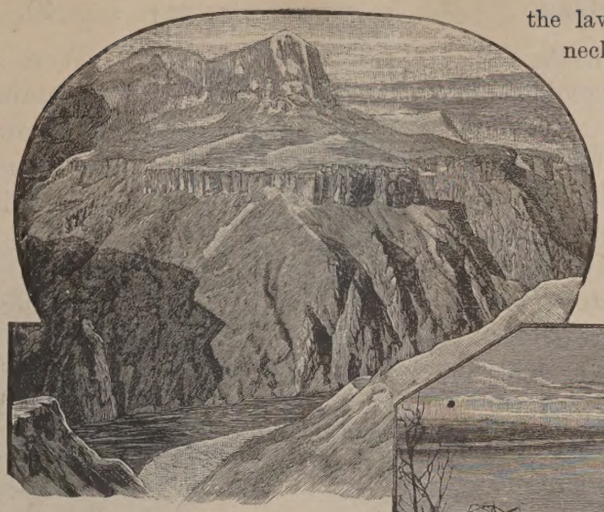
Young Mountains or Tilted Blocks, — Northwest Part of Basin Region.

Basin Ranges and Troughs, — Wet Season.

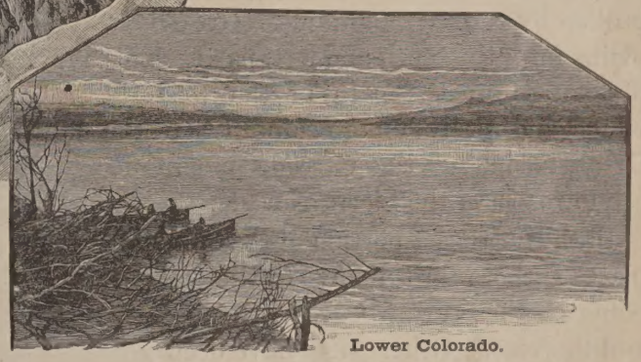
38. The Colorado Plateaus.

A broad region southeast of the Great Basin consists of lofty plateaus in which rivers have cut long and deep canyons. This highland region is known as the *Colorado plateaus*.

The rainfall on the Colorado plateaus is light, because high ranges lie to windward, near the Pacific coast. The higher and cooler parts of the plateau receive the most rainfall. The largest rivers in this region are fed by rains and melting snow on the Rocky mountains.



Canyon of the Colorado.

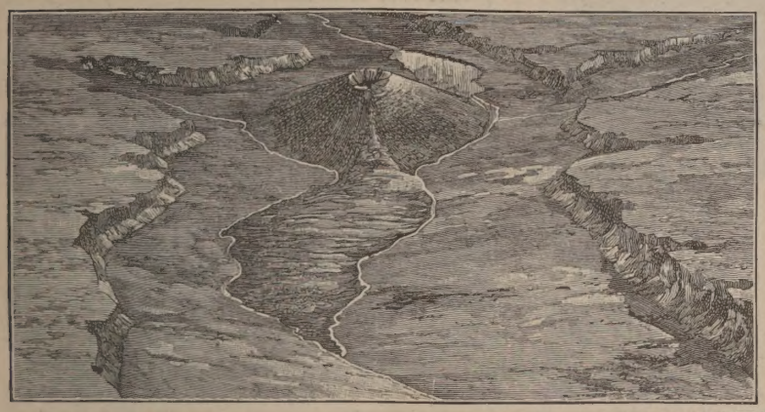


Lower Colorado.

These plateaus were formed ages ago by the slow uplifting of great blocks of land, many miles long and wide. The surfaces of some of the blocks are a mile or a mile and a half above sea level.

The edges of the higher blocks form cliffs a thousand or more feet high. In many places the rocky layers rise one over another, in broad benches, as shown in a picture on the opposite page.

Across these plateau blocks, the Colorado river has cut a great canyon, with steep sides all rugged with spurs and ravines. There one may see the rocks, layer on layer, of which the plateaus are made.



Young Volcano.

Mesa and Volcanic Neck.

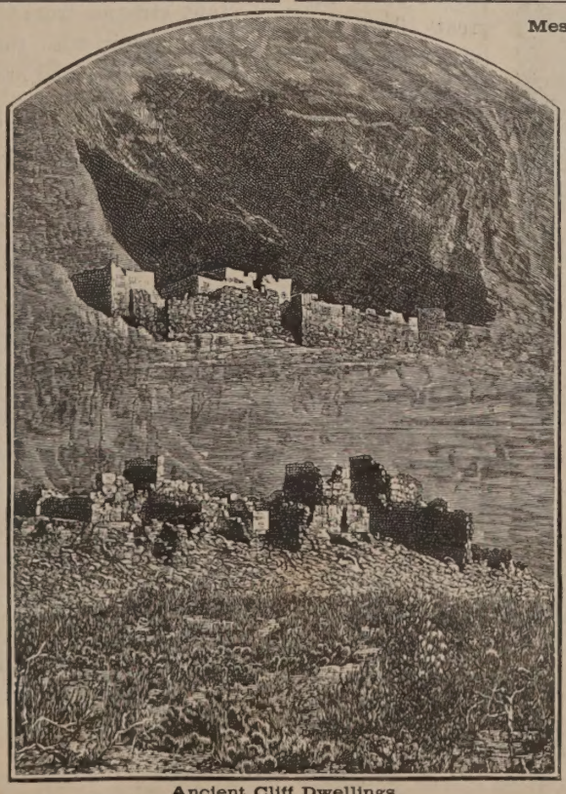
For a long distance the Colorado canyon is about a mile deep. Its sides consist of rocks of many colors, — gray, brown, red, yellow and purple. At times of sunrise and sunset, first one color and then another catches the light or is thrown into shadow, — making a marvelous display.

The Colorado canyon is a young river valley. Unlike most valleys, it does not serve as a place to live in or as a route of travel. The rapids in the river prevent navigation; the canyon is so deep and narrow that it can be followed only with great danger; and travel across it from cliff to cliff is almost impossible.

Several large volcanoes have been built on the Colorado plateaus, and many lava-flows have spread over their surfaces. Some of the volcanoes have wasted away, so that only the *necks* through which the lavas came are now to be seen. These necks form steep hills, or *buttes*.

Some of the lavas which flowed from the volcanoes to the lower land now form small table-lands, or *mesas*, — the surrounding surface having been worn away.

The Colorado plateaus are very thinly settled, for most parts of them are dry and barren, or covered with sage-brush. On several of the higher parts and near the streams there are groves and grassy tracts.



Ancient Cliff Dwellings.

On some of the mesas, tribes of Indians make their homes. The steep sides of the mesas afford protection from enemies.

Ruins of strange dwellings are found in shallow caves under the cliffs in some of the canyons of the Colorado plateau region. The Indians who made these dwellings disappeared before the white men set foot in that country. The people of that ancient race are now called "Cliff-dwellers." They knew how to weave coarse cloth and to make pottery. Their villages were built in the cliffs in order that the tribes might be safe from attack.

Many kinds of *cactus* plants thrive in this dry plateau country. Some of these are small, but others grow to trees.[1]

[1] On the next page there are pictures of two species of cactus trees and also of a *tree yucca*, or *Spanish bayonet*. The latter has stiff bayonet-like leaves.

39. The Columbia Plateau.

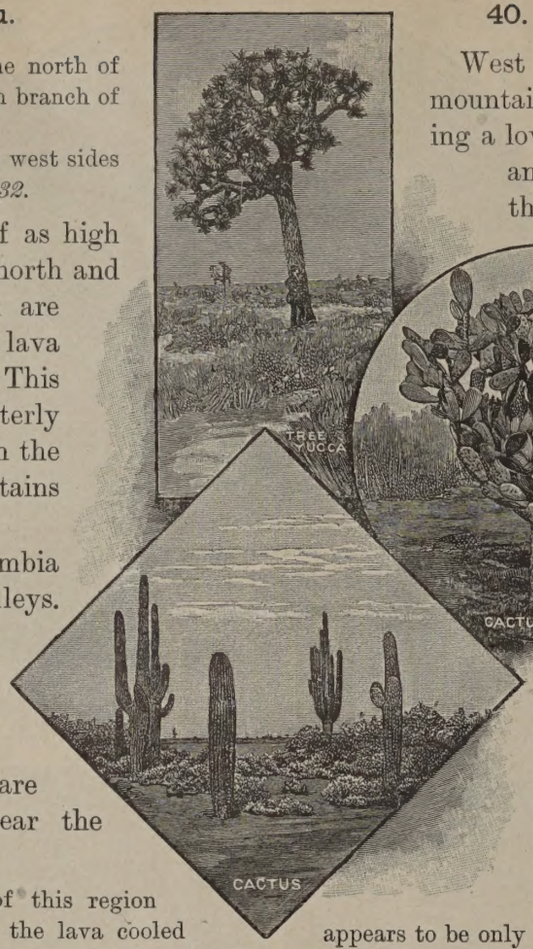
What large river drains the region on the north of the Great Basin? Name the largest south branch of this river.

What mountains are on the east and the west sides of the *Columbia plateau.* *See map on page 32.*

The Columbia plateau is about half as high as the Colorado plateau region. The north and east parts of the Columbia plateau are broken by rugged mountains. Great lava plains form the south and west parts. This plateau is in the path of the westerly winds, and receives more rainfall than the Great Basin, for the Cascade mountains are lower than the Sierra Nevada.

In the northeast portion of the Columbia plateau there are many fertile valleys. Some of these are wooded with pine and fir trees. Other parts have deep and rich soil which in recent years has yielded large crops of wheat.

The lava plains in the southwest are mostly dry and barren, except near the streams.



Long ages ago, the great lava-floods of this region were poured into a broad lowland where the lava cooled and formed an immense plain between high ranges on the east and the west. A picture on page 15 shows part of the lava plain, and one of the cuts on page 31 shows a cooled lava wave.

The lava plain of the Columbia region covers many thousand square miles,[1] and in places is hundreds of feet deep.

Ages have passed since the great flows of lava took place. Rivers have now worn canyons in the lava beds. The narrow flood plains are fertile and afford fine soil for the growth of wheat, but most of the region is barren and therefore thinly settled.

The Snake river has cut the longest and deepest of these canyons. Near the head of its canyon, the river plunges over the edges of some of the lava beds, making falls of great size and beauty. These are known as the *Shoshone falls.*

Along the sides of the canyon, both above and below the falls, can be seen the lava and ashes, layer on layer, through which the river has cut its channel.

[1] The lava-flows in this part of the continent cover from 150,000 to 200,000 square miles, — an area equal to about one twentieth that of our whole country. Part of the lava-flows took place in Canada. They are the greatest in the world, except perhaps those of the Deccan peninsula, in India.

40. The Coast Range and Valleys.

West of the Sierra Nevada and Cascade mountains lie several mountain ridges forming a low *Coast range.* Being near the ocean, and in the path of the westerly winds, this range has a milder and more uniform climate than the regions in the interior of the continent. Most parts of the range are wooded.

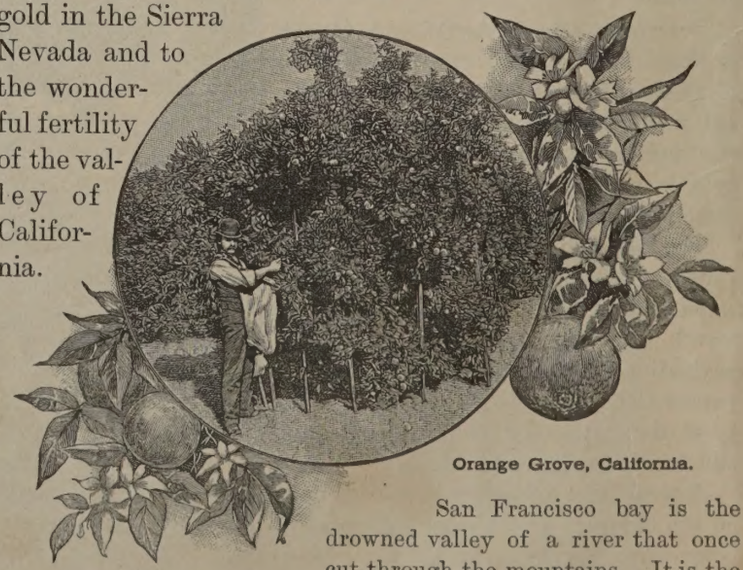
Near the foggy coast north of San Francisco bay grow the giant *redwood trees* which yield valuable lumber. The redwoods are almost as large as the "big trees" of the Sierra and belong in the same family. In the mountains south of the bay, there is one of the few places in the world where quicksilver is found.

One of the largest telescopes yet made is located on Mt. Hamilton, in the Coast range south of San Francisco. The object glass of the telescope is a yard in diameter. Seen through this great instrument, the moon appears to be only a few miles away.

The long lowland plain between the Sierra Nevada and the Coast range is called the *valley of California.* It is covered with waste washed from the mountains. This great valley has plentiful winter rains, but its summers are dry. Its principal products are wheat and fruit.

Many streams from the Sierra are still building up the floor of the valley plain with their flood deposits. The streams flow in shallow channels and are easily turned aside to irrigate the land.

The great port of San Francisco, on the fine bay of the same name, owes its rapid growth to the discovery of gold in the Sierra Nevada and to the wonderful fertility of the valley of California.

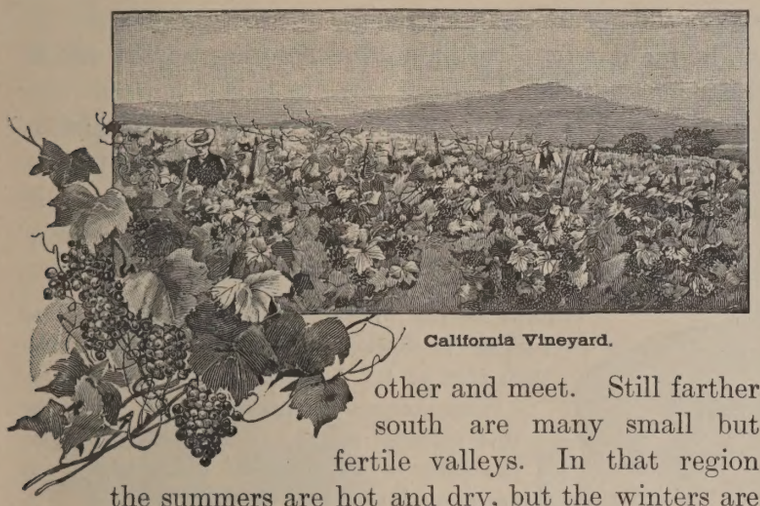


Orange Grove, California.

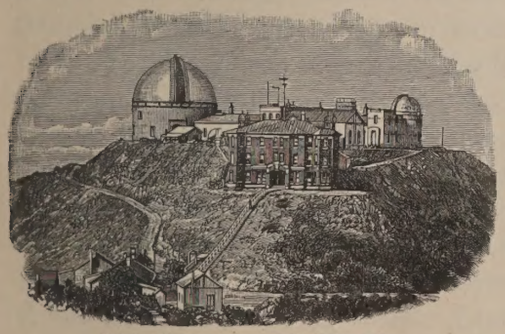
San Francisco bay is the drowned valley of a river that once cut through the mountains. It is the only break in the Coast range west of the Sierra Nevada, and forms one of the best harbors in the world. The streams which flow

from the west slope of the Sierra run along the valley, then unite and enter San Francisco bay.

In the south the valley of California ends where the Coast range and the Sierra Nevada bend towards each other and meet. Still farther south are many small but fertile valleys. In that region the summers are hot and dry, but the winters are mild and rainy. During the dry season, water for the fruit groves is led in ditches from the mountains. Oranges, lemons, grapes, and many other kinds of fruit thrive in the valleys.



California Vineyard.

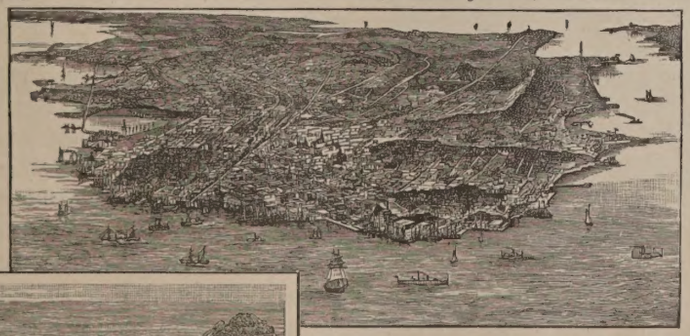


Lick Observatory, Mt. Hamilton.

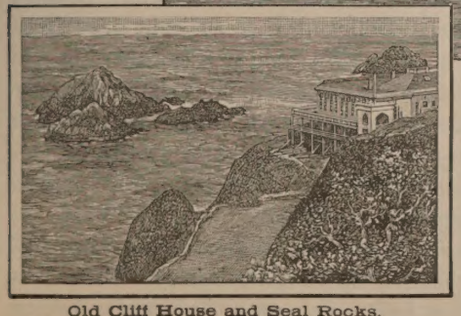
Owing to the mildness of the climate, the cities of southern California have become well known as health resorts.

The Willamette valley lies between the Cascade and Coast ranges. This region is well watered and is very fertile. Portland has a fine harbor on the Willamette river and has therefore grown to be the leading center of trade in the region.

Sand bars form at the mouth of the Columbia and make entrance difficult for large vessels. Massive stone walls, called *jetties*, have been built to narrow the channel and thus deepen the mouth of this great stream. The Columbia river is famous for its salmon fisheries.



San Francisco—Golden Gate.

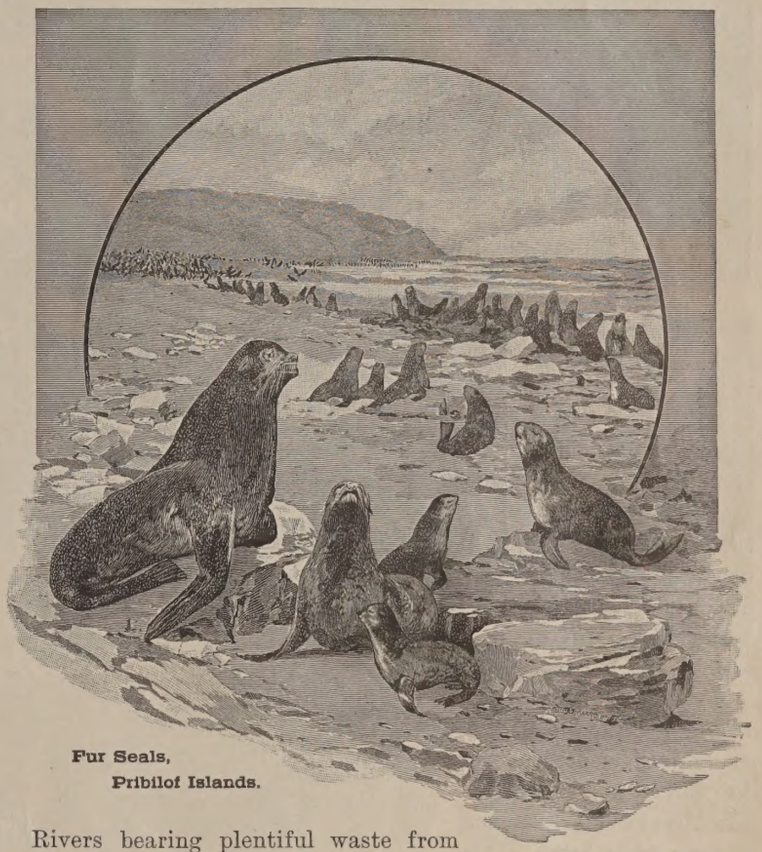


Old Cliff House and Seal Rocks.

Where is Puget sound? What large island partly incloses this great sound? *See map of United States in the Supplement.*

Puget sound is a drowned valley that leads sea-water through the Coast range and forms many fine harbors. The region about the sound is in the path of the westerly storm eddies and is one of the leading lumber districts in the world. Its mountain slopes are covered with pine, fir and spruce.

For a long distance northward from the head of Puget sound, the mountainous coast region is broken by deep valleys, now partly sunk beneath the sea. The drowned valleys form many *fiords* running far inland, and also long *sounds* behind islands. Puget sound is the most important of these drowned valleys. Steamers can follow the quiet waters of these sounds and thus avoid the rough ocean outside.



Fur Seals, Pribilof Islands.

Rivers bearing plentiful waste from the mountains have built deltas at the heads of many of the fiords, thus forming smooth-floored valleys only a little above sea level.

41. The Yukon Region.

Northward from the Columbia plateau the highland is mountainous but not very high nor very wide, except in the border ranges.

What mountains border this region on the east? What range is on the west?

In the far northwest, the ranges of the Rocky Mountain highland spread apart in the great peninsula of Alaska. The main range bends westward along the coast, to the end of the Alaskan peninsula.

The greater part of Alaska is drained by the Yukon river. This is one of the largest streams in America. The air of Alaska is cold, but clear and bracing.

The southwest shore of Alaska has a mild climate, although so far from the equator. The ocean winds are

there warmed by the drift from the Japan current. Warm moist winds from the sea are chilled in rising over the mountain slopes in Alaska and therefore yield very heavy snowfall.

Among the high peaks of this region are Mt. Logan and Mt. St. Elias. For a long time Mt. St. Elias was thought to be the highest peak on the continent, but Mt. Logan, recently discovered a few miles farther inland, is more than a fourth of a mile higher, — a little more than three miles[1] and two thirds above sea level.

Alaska belongs to the United States, but these high peaks are just east of the border line between Alaska and Canada.

From the snowy mountains in Alaska, many glaciers descend to fiords and yield countless icebergs. Streams flowing from beneath the glaciers build deltas in front of the ice. The delta shown in the picture on page 13 was thus made.

One of the pictures on this page shows the melting end of an Alaskan glacier. As the great stream of ice slowly creeps down from the upper snow-fields, rock waste falls upon it, and near the lower end trees grow in the soil on the ice. In the picture, the face of the glacier looks like a cliff almost hidden by the trees in front of it and upon it.

The shore-waters and many of the streams of Alaska abound in fish. The people in this district prepare great quantities of salmon for market.

Where is Bering sea? In summer large herds of seals visit the Pribilof islands, in Bering sea, to rear their young. Many of these seals are killed for their fine fur. The islands on the south, partly inclosing this sea, contain many volcanoes now active.

What lands are separated by Bering strait?

[1] Mt. Logan, 19,539 feet; Mt. St. Elias, 18,024 feet.

42. Highland of Mexico.

West of the gulf of Mexico rises the lofty highland of Mexico. This great mass of land is narrow in the south but broad in the north where it merges into the Basin region and the Rocky mountains.

The highest range of mountains running northward in Mexico is the Sierra Madre.

The narrow southern end of the *plateau* of Mexico is about a mile and a half above sea level. A chain of large volcanoes extends east and west across this end of the highland. Some of the craters are more than twice as high as the plateau.

Orizaba is the highest of these peaks, but its summit is more than a thousand feet lower than that of Mt. Logan.

Popocatepetl is another high peak in this volcanic region. Indians that live on the sides of Popocatepetl take sulphur in large quantities from the crater.

Northward from this chain of volcanoes stretches the lofty plateau. Below it, on the east, lie narrow marshy coastal plains. The region west of the Sierra Madre resembles the Basin region of our country.

Mexico lies north of the equatorial rain belt but is in the track of the trade winds. The wet season on the plateau and in the eastern coastal plain prevails in summer when the moist air from over the sea blows inland. Most of the western slope of the highland of Mexico is dry, because the winds that blow over it are warming on their way towards the heat equator. The region is too far north to be reached by the equatorial rains and too far south for the moist westerly winds. *See maps on page 24.*

The highland of Mexico is so near the coasts that there are no large river basins on either side. In times of heavy rainfall, many small streams on the east slope rush down gorges that they are wearing in the side of the plateau, and overflow parts of the narrow coastal plain.

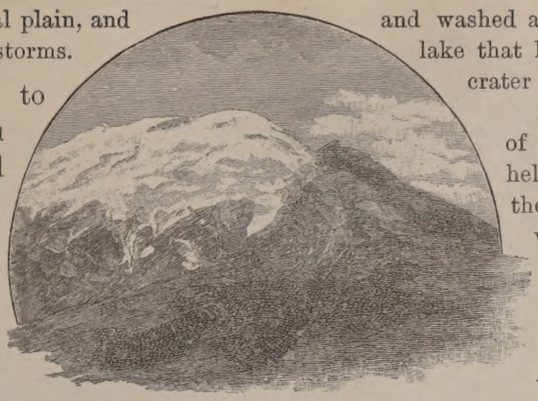
Several low ranges divide the high plain into shallow troughs like those in the Great Basin. The rainfall is so light that from most of the basins there is no overflow to the sea, and therefore no deep canyons have been cut in these parts of the plateau. In rainy seasons water collects in the basins and forms lakes. When the rains are over, the water in many of the lakes dries away.

The eastern coastal plains of Mexico are hot and unhealthful. They consist largely of swampy land, densely wooded.

There are no good harbors, because there are no drowned valleys nor large river mouths. The gulf coast of Mexico is fringed with long sand bars built offshore by the waves. Vera

Cruz, the chief port, is on the narrow coastal plain, and sand bars partly protect the harbor from storms.

Because of height and nearness to the equator, the climate of the plateau of Mexico is mild all the year, and there are no long periods of great heat or cold. This plateau produces oaks, cedars and other trees, as well as many smaller plants like those in the southwest part of our country.



Popocatepetl, Mexico.

Millions of Indians and white people live on the plateau of Mexico. The chief city is called *Mexico*. It is situated in a beautiful hill-encircled valley nearly a mile and a half above sea level.

Mexican Cart.

43. Central America.

Which part of North America is called *Central America?*

Most of this region is rugged country. Its highest parts are volcanic ranges rising mainly along the Pacific border, but branching inland. These ranges are not nearly so high as the great volcanic range in Mexico. The Pacific coast of this region is bold and rocky.

Water Carrier, Mexico.

Central America is in the belt of the trade winds and receives rains chiefly on the east slope. In summer this land has also the equatorial rains which water the west as well as the east coast.

The eastern coastal plain of Central America is a continuation of that in Mexico. These damp lands are densely wooded and are covered with jungles in which many wild beasts live. Plants grow so quickly there that it is difficult to keep the lands cleared for farming.

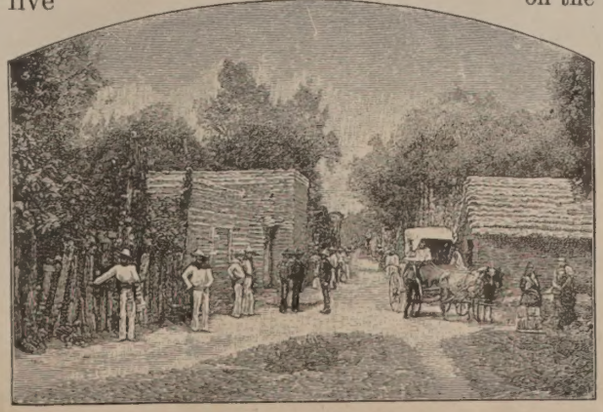
Among the ranges of Central America are broad plains, or upland valleys, that average about half a mile in height. The soil of these plains consists mainly of weathered volcanic ash, very fine and fertile. Many white people, Indians and Negroes live in these upland valleys.

Locate Lake Nicaragua. This lake is part of a route that has been selected for a canal between the two oceans.

On an island in the lake there is a volcano whose sides were at one time laid out in beautiful gardens. Not many years ago, great streams of lava and ashes burst from the crater and flowed down the sides of the cone, burying the gardens many feet deep.

Another volcano in Central America poured a flood of water over a town and washed away its houses. The water came from a lake that had formed in the crater. There are many crater lakes in this region.

In many parts of Central America are ruins of temples and idols made by Indians who held the land when the white men first went there. Most of the ruins are now overgrown with trees.



Mexican Village.

44. The Appalachian Highland.

East of the Rocky mountains spreads the great central plain of North America. This plain reaches from the Gulf of Mexico to the Arctic ocean.

The *Appalachian highland* is east of the southern half of the central plain. This highland extends southwest from the gulf of St. Lawrence nearly to the gulf of Mexico.

The Appalachian highland is well supplied with rainfall at all seasons. Moist winds reach it from over the gulf of Mexico and the Atlantic ocean. The slopes of the highland are wooded with oak, maple, cone-bearers and many other kinds of trees.

Century Plants, Mexico.

The Appalachian highland consists of several regions which may be named as follows:

The *Old Appalachian range,* — including the New England highland, the Blue ridge, the Carolina highland, and other ridges having various names.

The *Piedmont Belt.* The word *piedmont* means *foot of the mountains,* and is here applied to the rolling or hilly land along the eastern foot of the Old Appalachian range.

The *Great Valley,* — a long and narrow lowland on the west of the Old Appalachian range.

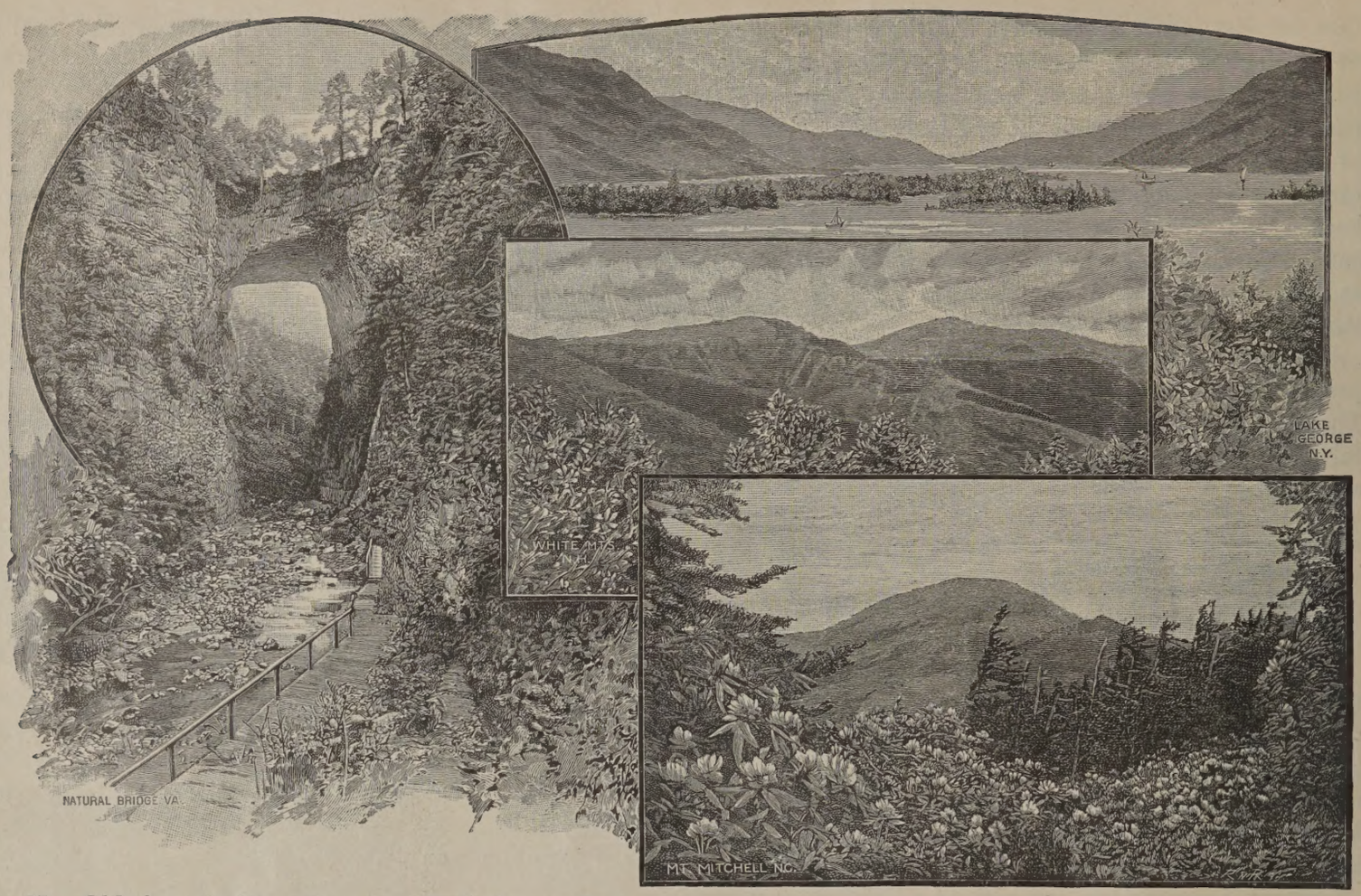
The *Allegheny ridges,* — rising on the west of the Great Valley.

The *Allegheny plateau,* — a broad upland region next on the northwest.

The boundaries of these regions are shown by lightly-dotted lines on the map. *See page 32.*

Note: The large island of Newfoundland, though beyond the gulf of St. Lawrence, may be treated as part of the Appalachian highland. This island has sunk partly beneath the sea, making a very broken coastline. In the ocean southeast of the island are shallow places known as the *banks* of Newfoundland. These banks abound in cod, halibut and other kinds of fish.

The ridges of the *Ozark highland* resemble the Allegheny ridges. *See lesson 47; also map on page 32.*



45. Old Appalachian Range and Piedmont Belt.

The portion of the Old Appalachian range known as the *New England highland* stretches from the gulf of St. Lawrence to the Hudson river.[1] This highland consists of a broad and rolling upland, above which rise hills and mountains. The surface is also broken by many valleys in which lakes abound.

The highest group of peaks in this highland is known as the *White mountains*. The Connecticut valley, with its fine farming lands, lies between this group and the *Green mountains*.

Mt. Washington, one of the White mountains, is the highest peak in the northeast part of our country.

The rolling or hilly *piedmont* slope of the New England highland reaches to the sea. The cities and towns of this region are nearly all on the seacoast or near the falls in the rivers. Boston is the greatest seaport in this region.

The surface of the New England highland was heavily scoured by the ancient ice-sheet from the Laurentian highland. The weaker rocks were worn away, and rock waste was left unevenly spread over the region. When the ice melted, the streams were held back in the scoured basins and behind the barriers of drift, or rock waste, thus forming numerous lakes. Many of the streams were pushed aside from their old valleys and were made to flow over ledges from which they now fall in rapids and cascades. Since the ice melted, there has not been time for the streams to cut down the ledges and drain the lakes. Towns and cities have grown up at the falls and rapids where water power is supplied to many mills and factories. The coastline of this piedmont slope is very irregular, for the land has sunk partly beneath the sea, forming deep bays or fiords which separate headlands and islands. Waves

[1] The New England *states* occupy only part of this highland.

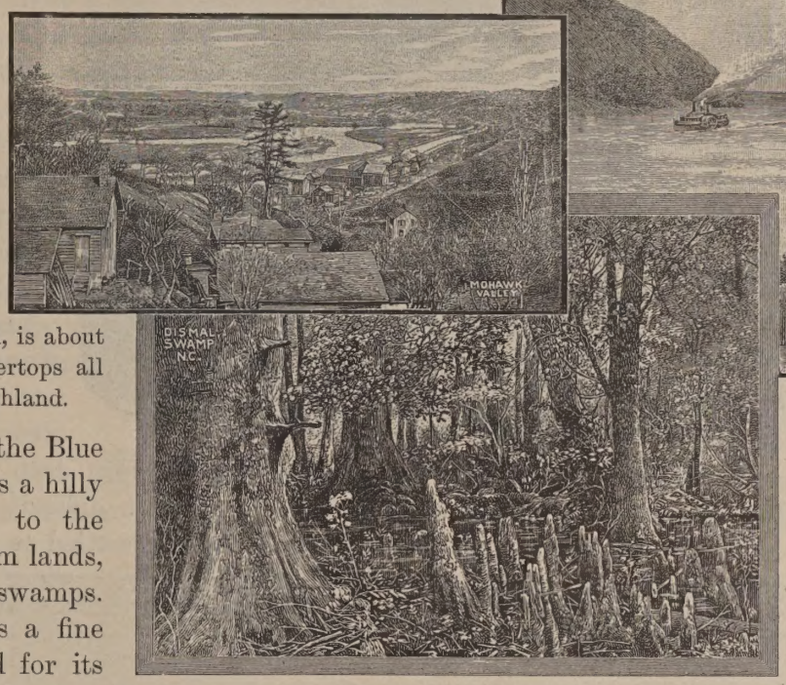
on the exposed shores are cutting cliffs[1] but the rocks are so hard that they wear away very slowly.

For some distance southwest of the Hudson river, the Old Appalachian range is neither so high nor so wide as in the New England highland. This lower part looks like a long and narrow plateau. Still farther southwest, the old range becomes higher and wider and is there called the *Blue ridge.*

On the south, the Blue ridge runs into the Carolina highland which contains the highest peaks in the whole range.

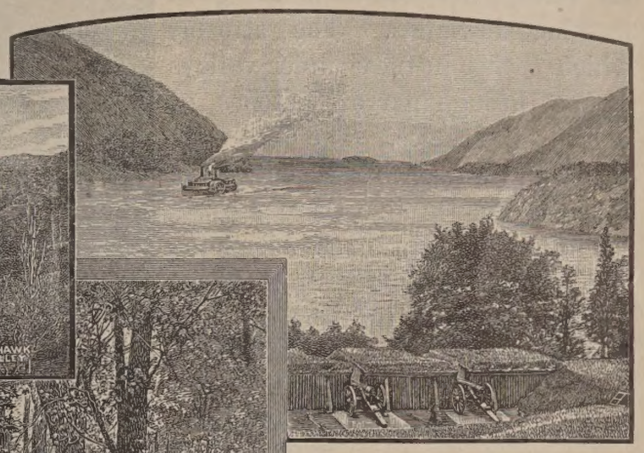
Mt. Mitchell, one of the Black mountains in the Carolina highland, is about a mile and a fourth high and overtops all other peaks in the Appalachian highland.

The piedmont slope east of the Blue ridge and Carolina highland is a hilly region gradually descending to the wide coastal plain, with its farm lands, its pine forests and its cypress swamps. This part of the piedmont is a fine farming district and is noted for its large crops of cotton and tobacco.



A Cypress Swamp.

with other valleys to make an open highway northward to the St. Lawrence basin and westward up the Mohawk river towards the Great Lakes. Northward the valley route leads through lake George and lake Champlain.



Hudson Gorge, West Point.

A large part of the Hudson gorge has been slightly drowned, making a fine water way far inland from the seacoast.

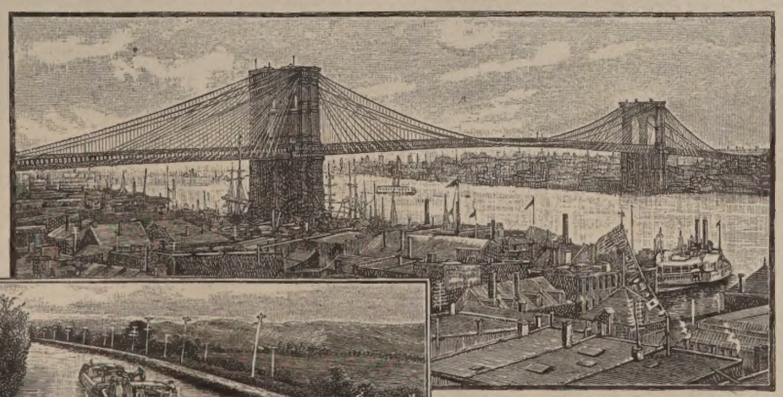
Nearly three fourths of a century ago, the long *Erie canal* was built along the Mohawk branch of the Great Valley, from lake Erie to the Hudson river. This canal furnishes a cheap route of trade between the Great Lakes and the Atlantic seacoast. Railroads now follow closely along the same route. The great port of New York owes its growth largely to its position on an excellent harbor at the mouth of the Hudson valley, where trade can easily be carried on, both inland and across the oceans. The other gorges which cross the highland are also used as lines of travel.

46. The Great Valley and Allegheny Ridges.

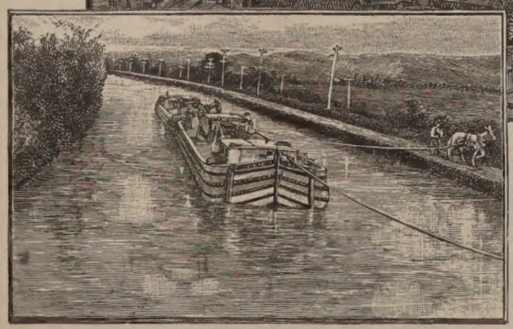
The Great Valley in the Appalachian highland is a long lowland, with mountains on the east and the west. At the north, the Great Valley opens into the St. Lawrence basin; and at the south, into the Gulf coastal plain. The greater part of the long valley is covered with farms.

The largest rivers rising in the Appalachian region do not run *along* the Great Valley but *across* it, and escape by deep and narrow gorges worn through the inclosing highland. The Hudson, Delaware, Susquehanna, Potomac and James rivers rise in the highland *west* of the Great Valley and flow across the valley and the Old Appalachian range. *See colored map of Middle Atlantic states.*

The Tennessee river rises in the old range *east* of the long valley, but flows westward across the valley and reaches the Ohio river.



New York and Brooklyn.



Erie Canal.

The most important of these cross-gorges in the Appalachian range is that of the Hudson river, for it unites

Water slowly dissolves limestone and thus forms caves or caverns. There are many of these in the Appalachian region. The Cavern of Luray, in the Great Valley of Virginia, is one of the most beautiful.[2] *See picture on page 44.*

The roofs of caves sometimes fall, making deep gorges; or only a small part may remain standing in the form of an arch. The Natural Bridge shown in the picture on page 42 is in the Great Valley. This rocky arch is over 200 feet high. *See colored map of Middle Atlantic states.*

The long even-crested ridges or folds west of the Great Valley, as far north as the Hudson gorge, may be called the

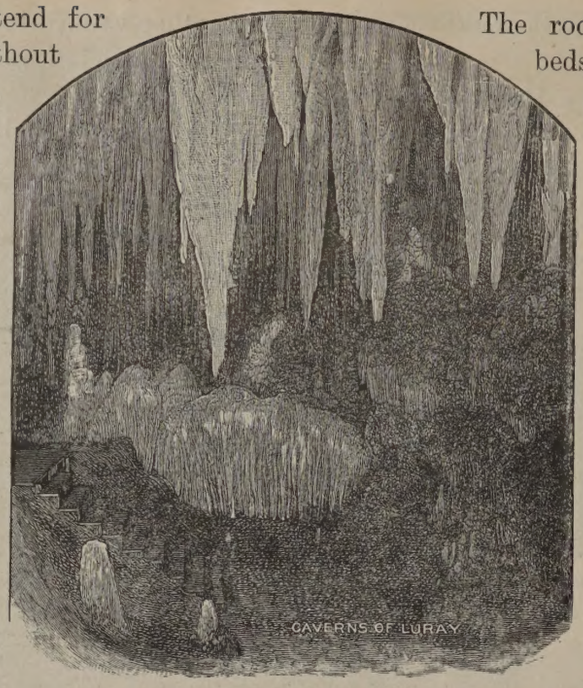
[1] See pictures of Grand Manan, page 16.

[2] *Mammoth Cave,* Kentucky, is larger than that of Luray.

Allegheny ridges. They often extend for many miles in a straight course, without any peaks. *See note to picture below.*

These ridges are all forested, and the valleys between them are good farming lowlands. The streams which gather in these inner valleys escape through narrow notches, or *gaps*, in the ridges. The chief railroads and wagon roads enter the inner valleys through these gaps.

The northern part of the Allegheny ridges supplies almost all the hard coal and some of the iron ore used in our country.



The rocky layers of the plateau contain beds of soft coal and iron ore. The many valleys cut by branch streams expose these valuable beds on the slopes, so that they can be easily found and mined. The northern half of the plateau yields great quantities of petroleum and natural gas.

Pittsburg has grown up at the place where two rivers unite to form the Ohio. This city is noted for its coal trade, iron mills and glassworks. The Ohio river forms a fine water way from Pittsburg to the Mississippi river.

47. The Allegheny Plateau.

The eastern side of the Allegheny plateau falls by steep slopes into valleys next to the Allegheny ridges. On the west and south, the plateau descends gradually to the prairies and the Gulf coastal plain.

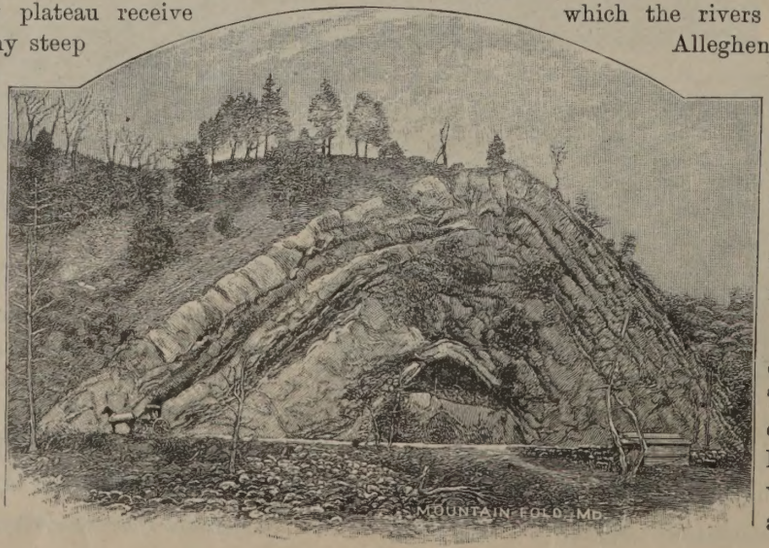
The southern half of the Allegheny plateau is mostly drained by two large tributaries of the Ohio river. These streams and their branches have worn deep valleys, making a very rugged region. Travel is difficult and this part of the plateau is not so thickly settled as that farther north.

This plateau is so greatly worn by branching streams that it is known to be older than the smoother plateau of the Columbia basin, where the valleys are narrower.

The rivers of the Allegheny plateau receive water so quickly from the many steep valley-slopes that they often rise thirty or forty feet in floods. Nearly all these rivers flow into the Ohio.

Most of the higher parts of the Allegheny plateau are forested and yield valuable timber. The lower western portions of the upland have been cleared of trees and now form rich farming and grazing districts, — famous for wool and for dairy products.

The Ozark highland, west of the Mississippi river, resembles parts of the Appalachian highland. The southern part of the Ozark region has many straight and even-crested ridges through which the rivers have cut gaps like those in the Allegheny ridges.



The northern half of the Ozark highland is a plateau whose main slope is towards the Missouri river. This plateau is greatly worn by streams and in form resembles the Allegheny plateau; but many of the even uplands in the Ozark region are open prairies.

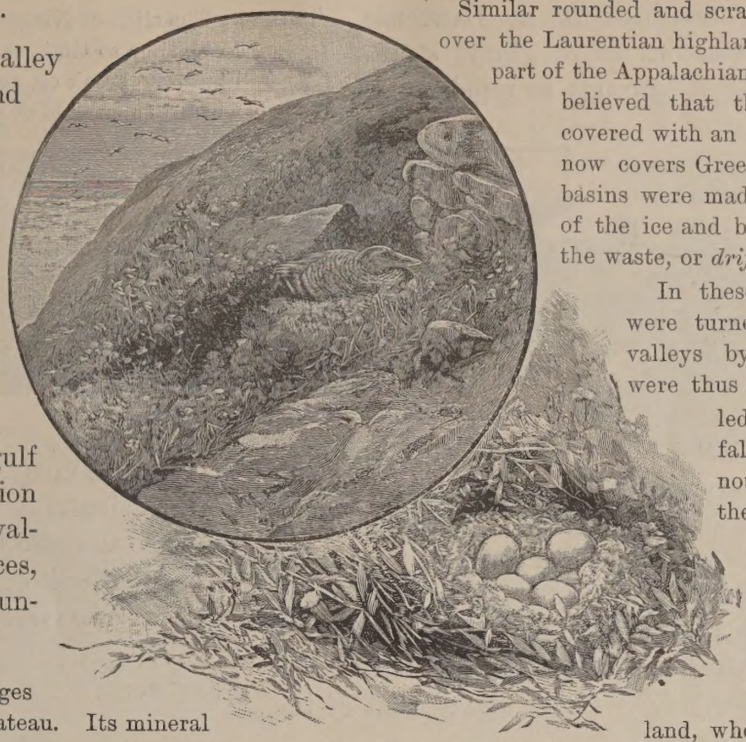
Note: This picture shows part of one of the Allegheny ridges. The folded rock-layers were once covered by many others, but they have long been exposed to the weather and have therefore wasted away.

48. The Laurentian Highland.

The St. Lawrence river flows in a valley that separates the Laurentian highland from the Appalachian.

The Laurentian highland extends from the Labrador peninsula southwest towards the Great Lakes; thence running north of these bodies of water, the highland bends to the northwest and approaches the Arctic coast not far from the west shore of Hudson bay.

Northwest of the St. Lawrence gulf and river the highland is a desolate region strewn with boulders and broken by valleys. Bare rocky hills rise in some places, but no part deserves the name of mountain range.



Eider Duck and Nest.

This region was once mountainous, but ages ago it was worn down to a low but rough plateau. Its mineral wealth has not been developed to any extent.

The northeast part of our continent has sunk partly beneath the sea, making the coast line very irregular. The St. Lawrence valley was thus partly drowned, forming a broad gulf and carrying the navigable waters far inland.

In the valleys of the low plateau are many lakes and swamps through which streams flow. Near these grow thick forests that make traveling very difficult. The people travel mostly in canoes through lakes and streams, thus avoiding the swamps and forests.

The winter winds which reach the peninsula of Labrador, from over the northern lands, are cold and piercing. The winds which blow over it from the sea are always chilly, for a cold polar current sweeps past this part of the Atlantic coast.

Many fur-bearing animals are found in this desolate region. Among these are beavers, foxes, martens and muskrats. Two species of large deer, the moose and the caribou, graze on mosses and tender shoots of trees in this cold country. *See pictures on page 50.* Ducks, geese and other seafowl abound along the rocky shores.

As the winters are severe, the rocky uplands rugged and the valleys swampy, the old highland is thinly settled. The few thousand Indians and still fewer white people who make their homes in that cold country live by hunting.

South and west of Hudson bay, the highland rises but little above the neighboring plains.

Far to the north and northeast of the Laurentian highland are many large islands. Ages ago these were probably part of the continent and were afterwards separated from it by the sinking of the land. The largest of these islands is Greenland. What have you read about the great ice-sheet of Greenland?

The creeping ice scrapes away the rock waste beneath, and rubs the rocks round and smooth,—scratching them with stones and sand that are dragged along. *See picture of rounded rocks, page 10.*

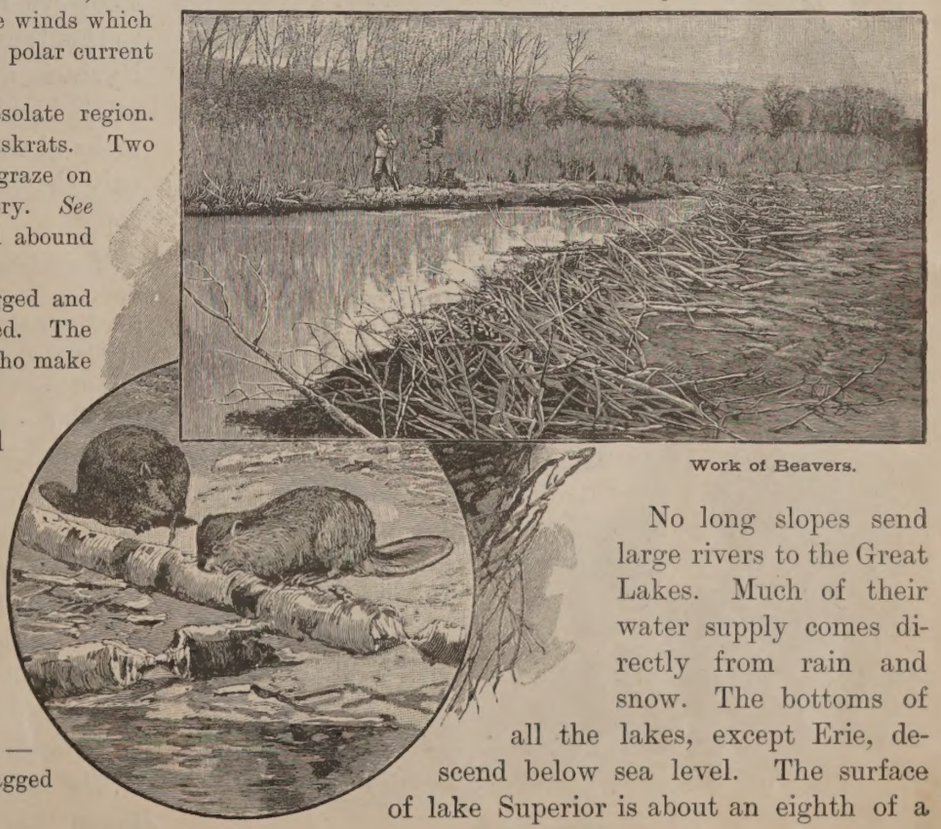
Similar rounded and scratched rocks are found all over the Laurentian highland and over the northern part of the Appalachian highland. It is therefore believed that these regions were once covered with an ice-sheet like that which now covers Greenland. Their many lake basins were made chiefly by the scraping of the ice and by the uneven heaping of the waste, or *drift*, which the ice left.

In these regions many streams were turned aside from their old valleys by barriers of drift, and were thus made to flow over rocky ledges where we now find falls and rapids. If it had not been for this action of the ice-sheet, there would be no lakes and but few falls in countries as old as the Laurentian or the New England highland. In the southern part of the Appalachian highland, where ice has not worked, there are no lakes, and falls are fewer than in the New England highland. The streams have had time to deepen their channels and thus drain the ancient lakes.

49. The St. Lawrence Basin.

The Great Lakes fill hollows on the southward slope from the Laurentian highland. These lakes and the St. Lawrence river, with all the streams flowing into them, form the St. Lawrence system.

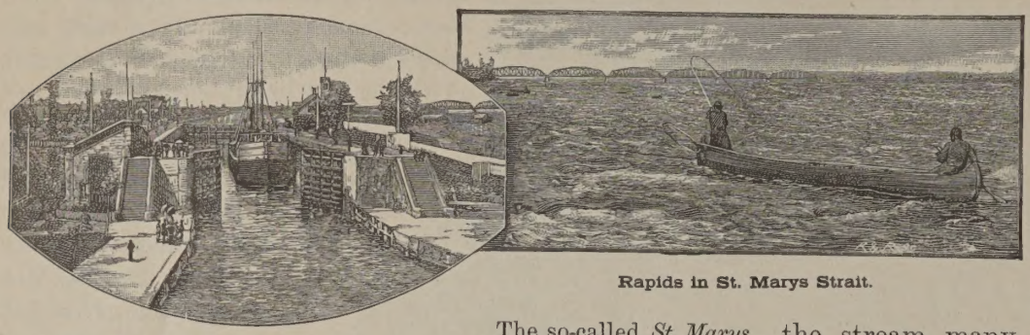
The basins of the Great Lakes were deepened, though not wholly formed, by the rubbing or scouring of the ancient ice-sheet which moved across them from the Laurentian highland.



Work of Beavers.

No long slopes send large rivers to the Great Lakes. Much of their water supply comes directly from rain and snow. The bottoms of all the lakes, except Erie, descend below sea level. The surface of lake Superior is about an eighth of a

mile higher than the mouth of the St. Lawrence. The outlet of this lake is known as St. Marys strait. It is not navigable, because it descends in rapids to the level of lake Huron.



Lock in the "Soo" Canal.

Rapids in St. Marys Strait.

The so-called *St. Marys strait* is a river about sixty miles long. Which picture shows the rapids in this river? Vessels avoid these rapids by going through the "Soo" canal. One of the pictures shows a steamer ready to come from the canal lock.

There are no rapids to prevent vessels from sailing between lakes Michigan, Huron and Erie, but between lakes Erie and Ontario there is an abrupt descent of the upland country, in a low bluff.

Niagara river, the outlet of lake Erie, originally fell over the northern edge of this upland, thus forming the falls of Niagara. Since then the river has slowly cut a deep gorge back into the bluff, — the falls always keeping at the head of the gorge. They are now about six miles back from the edge of the bluff.

The falls of Niagara are about three fourths of a mile wide and one hundred and fifty feet high. Below the falls, the river rushes through its long gorge, making rapids of great size and grandeur.

Niagara Falls.

The cliffs of Niagara consist of layers of limestone on softer rock. From time to time, as the lower rock is worn away, huge masses of limestone break off and fall into the gorge. The stream must have worked thousands of years to cut this great valley, yet that time is short compared with the period during which the Hudson river was cutting its long gorge.

A large water way, known as the Welland canal, has been made to join lakes Erie and Ontario.

From lake Ontario the St. Lawrence river forms a water way to the sea. The river has rapids, but canals have been built past them. Going down the stream, many steamers pass over the rapids. The city of Montreal is below the lowest rapids, near the head of the drowned part of the valley. That city marks the limit of navigation for ocean steamers on the St. Lawrence river.

Where is lake Champlain? Into what river does its outlet flow? What mountains are west of this lake? *See map, page 143.*

The rocks of the Adirondack mountains and of the highland south and west of lake Superior are like those in the Laurentian highland.

Niagara Gorge.

They are roots of old worn-down mountain ranges, and the land surface which long ago was high above the mineral layers is now brought down close to them. Both these small highlands yield large quantities of iron ore. The rocks of the old region south of lake Superior contain not only the richest known deposits of iron ore, but also much copper.

The lightly-dotted line shown a little south of lake Superior on the map, page 32, marks off a district that is drained by streams of the Mississippi system, yet the district is part of the old deep-worn highland described above. A lightly-dotted line has also been placed round the Adirondack highland, yet parts of it belong to the Hudson and St. Lawrence basins.

The slopes around the upper three Great Lakes form the leading lumber district in our country. The forests yield both hard and soft woods, such as are used in making furniture and in building houses.

The St. Lawrence system is the best inland water way in the world. Hundreds of large steamers and other vessels help carry on trade between the lake ports and bear away many of the products of the mines, the farms, the forests and the workshops.

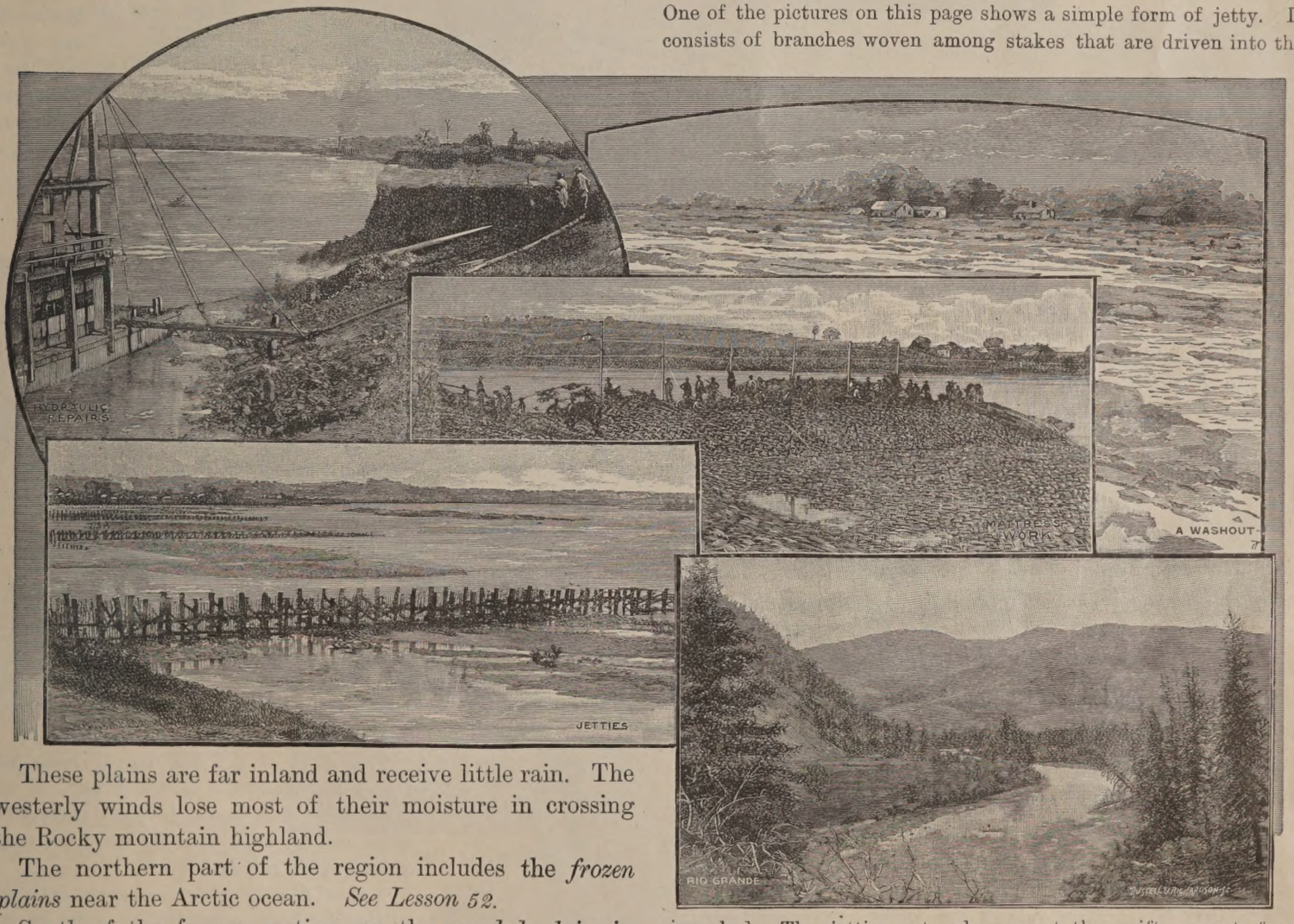
The largest of all these ports is Chicago. This city has grown very rapidly, because it is within easy reach of

forests around the upper lakes, of farms and pasture lands in the central plain, of iron mines near lake Superior, and of coal fields in the plain on the south.

Locate Buffalo, Cleveland, Detroit and Milwaukee. These lake ports are smaller than Chicago, but they resemble it in their trade.

50. The Western Plains.

Except in the far north, the part of the great central plain lying next east of the Rocky mountains has a long gradual slope eastward.



These plains are far inland and receive little rain. The westerly winds lose most of their moisture in crossing the Rocky mountain highland.

The northern part of the region includes the *frozen plains* near the Arctic ocean. *See Lesson 52.*

South of the frozen portion are the *wooded plains* in Canada. The rainfall there is not heavy, but it has time to sink into the soil, for the hot season is short and the cold ground dries slowly. Snow lies in the forests for several months each year. Large streams flow eastward from this region.

In our own country, south of the wooded plains, lie the dry *Western plains*. Parts of these plains, near the mountains, are more than a mile above sea level.

From the Rocky mountains many large rivers flow eastward across the dry plains. These streams run swiftly down their sandy valleys and carry an immense quantity of land waste. Dry upland plains stretch from one valley to another. Most of these uplands are gently rolling. In some places, bench lands rise high above the general level of the country.

Describe the course of the Missouri river. This stream from its mountain source to the gulf of Mexico is thought to be the longest on the earth. The name of the stream is often written *Missouri-Mississippi*, because the Missouri joins the Mississippi long before the latter reaches the gulf of Mexico. Describe the course of the Arkansas river.

Large rivers like the Missouri and the Mississippi often do much damage when flooded. They sometimes cut into their banks, — destroying fields and washing away railroads.

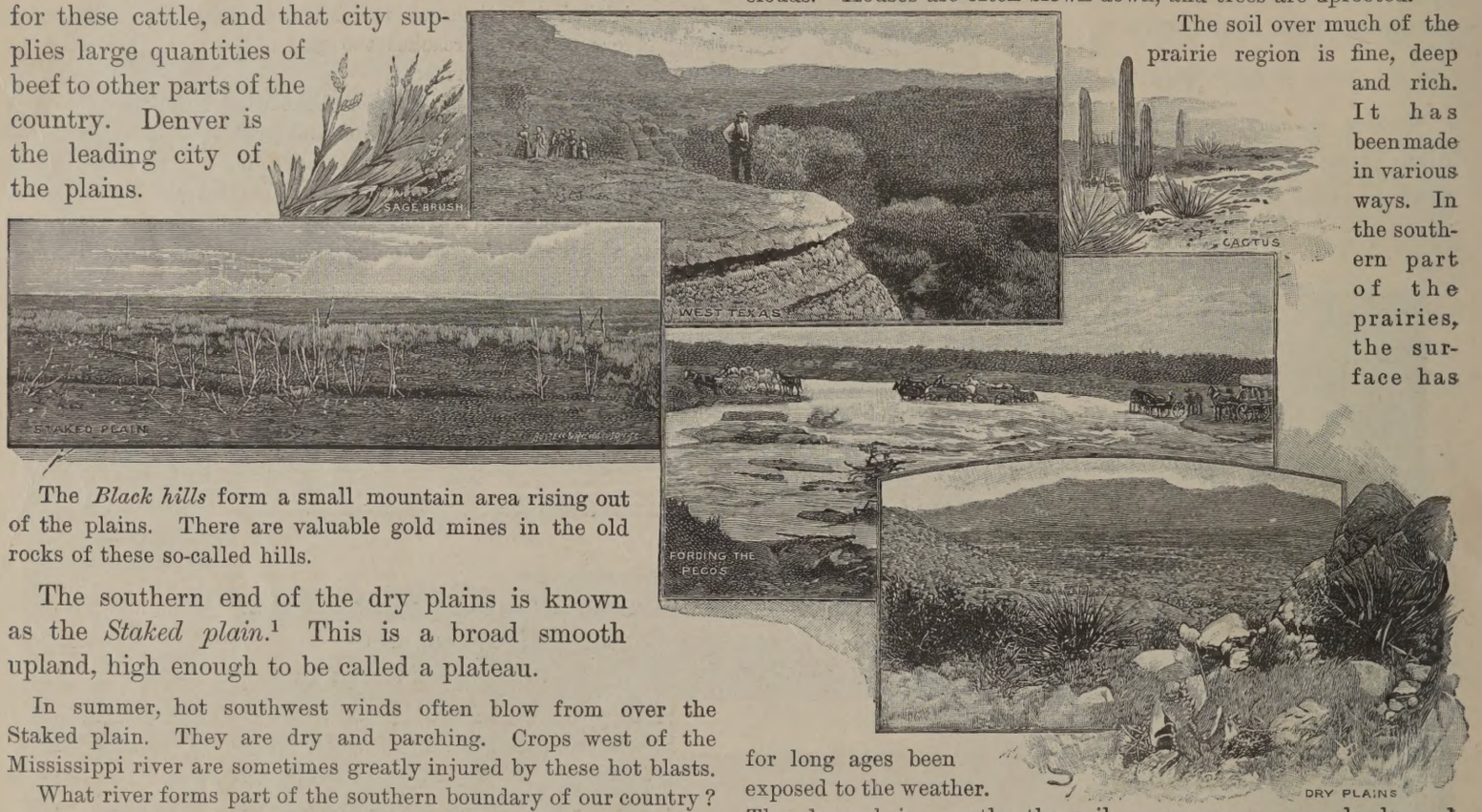
Jetties are built in some places to protect the river banks. One of the pictures on this page shows a simple form of jetty. It consists of branches woven among stakes that are driven into the river bed. The jetties not only prevent the swift currents from striking the bank, but they also cause the muddy water to eddy into still places between them and there deposit mud or sand.

Some river banks are protected by interwoven branches, making mattress work like that shown in the picture. Powerful force pumps are first used to slope the banks. Then the mattress is made and sunk, — reaching from flood level far down upon the river bed. Swift currents cannot cut through the mattress work till it is worn out.

The dry plains are not a desert, nor are they fertile. Sagebrush thrives in many places, and scanty grass grows almost everywhere. The best lands are in the large river valleys, or near the mountains where many small streams flow. There are good farms where canals and ditches have been made to turn aside river-water over the land.

Many attempts have been made to get water from wells to irrigate the dry plains, but the supply of ground water is so small that a great part of the plains cannot be irrigated.

Large herds of cattle graze on the western plains. Kansas City, Kansas, has grown to be a leading market for these cattle, and that city supplies large quantities of beef to other parts of the country. Denver is the leading city of the plains.



The *Black hills* form a small mountain area rising out of the plains. There are valuable gold mines in the old rocks of these so-called hills.

The southern end of the dry plains is known as the *Staked plain*.[1] This is a broad smooth upland, high enough to be called a plateau.

In summer, hot southwest winds often blow from over the Staked plain. They are dry and parching. Crops west of the Mississippi river are sometimes greatly injured by these hot blasts.

What river forms part of the southern boundary of our country?

The Western plains are thinly settled, because so little of the land receives water enough to make it productive.

51. The Prairies.

The lowlands in the upper Mississippi valley consist of level or rolling grassy plains, called *prairies*. They merge into forest lands on the east and south, into dry plains on the west, and into colder plains on the north.

The chief rivers in the prairie region have cut shallow valleys in the upland through which they flow. The valleys are wider and more numerous in the southern prairies than in the northern.

Most of the rain which falls in the prairies is brought by summer winds from over the warm gulf of Mexico. The heaviest rains fall on the parts of the prairies east of the Mississippi. For some distance west of the river there is plenty of rain; but still farther west, towards the dry plains, the crops often suffer in periods of drouth.

The summer rains of the prairies generally fall from thunderstorms. Great cloud-masses several miles high, moving eastward about as fast as a railroad train, give brief rains to belts of country from fifty to two hundred miles wide, but leave dry regions on either side, until other storms come to water them.

Violent squalls usually blow out from the storms, in front of the rain. Destructive tornadoes sometimes occur beneath the storm-clouds. Houses are often blown down, and trees are uprooted.

Coyote.

The soil over much of the prairie region is fine, deep and rich. It has been made in various ways. In the southern part of the prairies, the surface has for long ages been exposed to the weather. The slopes being gentle, the soil moves away very slowly and therefore has time to form to a great depth.

The northern part of the prairie region was once covered by the great ice-sheet which moved from the Laurentian highland across the St. Lawrence valley. This ice-sheet dragged much rock waste into the prairies, spreading it out as a deep layer of soil. The waste was scraped from rocks of many kinds, and was ground and mixed under the ice. Soil of this kind is called *till*. The sheet of till has buried many old valleys and has made the northern part of the prairies smoother than it was before the ice-sheet came, and smoother than the southern parts of the prairie region now are.

A third kind of prairie soil is the sediment of shallow lakes that covered parts of the surface, after the ice-sheet had melted back. Some of the finest and richest prairie soils are of this kind.

The prairies in the valley of the Red river of the North were thus formed. These prairies lie partly within the United States and also extend northward far beyond the border of our country, into Canada.

Ages ago a great lake covered the region now known as the Red river prairies. Muddy streams flowed into the lake, and fine soil settled evenly over the bottom. When the lake was drained, the smooth bottom became a level plain. The water flowed off long ago, and yet the plain is so young that streams have hardly cut its surface. The Red river prairies form part of the Nelson river basin.

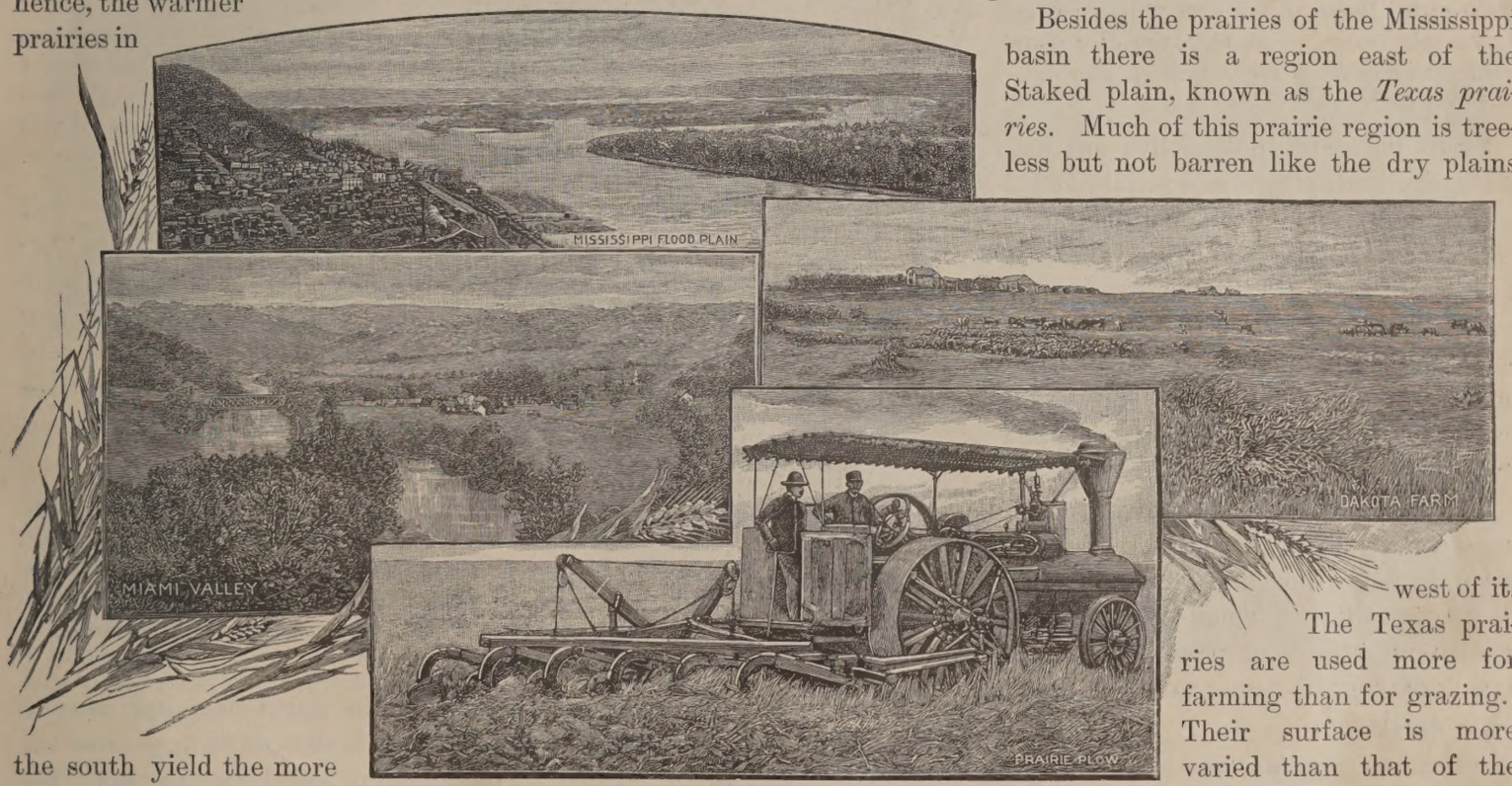
[1] Or Llano Estacado (stockaded plain).

This region is famous for its wheat. One of the pictures below, marked *Dakota farm*, shows a part of the lake plain that is in the United States.

South of each of the Great Lakes there are belts of low hills made of rock waste dragged there by the ancient ice-sheet which crept from the snowy Laurentian highland. These hills are old moraines heaped on the surface of the country at the melting front of the ice-sheet. Many small lakes lie in hollows among the hills. Farther south, where the ice did not reach, lakes are rare.

West of lake Michigan are found a great number of drumlins, or rounded glacial hills. These were formed *under* the ice-sheet which built the hilly moraines a little farther south. Another remarkable group of drumlins occurs south of lake Ontario,[1] along the line of the Erie canal.

The prairies form one of the richest grain regions in the world. Wheat and corn are leading products. The former is hardy, but the latter is easily killed by frost; hence, the warmer prairies in the south yield the more corn, while those in the cooler half lead in harvests of wheat.



Few trees grow wild in the prairies, except along the streams, but many trees have been set out on the prairie farms. Most forest trees thrive best in loose and coarse soil, like that found on hills or on old mountain slopes. The prairie soil is very fine and firm, but yields readily to the plow.

Water sinks slowly into this compact soil. Heavy rains therefore swell the streams. In springtime, before the frozen soil has thawed, rains and melting snow often cause the rivers to spread far and wide over their flood plains. These floods often do much damage, but they also leave coatings of fine soil on the plains.

[1] In riding between Rochester and Syracuse, south of lake Ontario, many drumlins may be seen.

Most of the cattle and hogs in our country are raised on the prairies, where there is plenty of grass and corn. In the prairies southwest of Lake Michigan are extensive coal fields yielding immense quantities of soft coal.

Chicago has grown to be the greatest meat-packing center and grain market in the world, because the city is so near the fertile prairies, and because the railroad and steamer lines centering at Chicago reach so large a part of our country.

Minneapolis has fine water power and is near the wheat regions. This city therefore leads the world in making flour.

The great agricultural region of the middle Mississippi valley has its chief trade center at St. Louis. This city has a very large traffic by railroads on all sides and by boats down the great river.

Besides the prairies of the Mississippi basin there is a region east of the Staked plain, known as the *Texas prairies*. Much of this prairie region is treeless but not barren like the dry plains west of it. The Texas prairies are used more for farming than for grazing. Their surface is more varied than that of the prairies of the upper Mississippi valley.

52. The Northern Plain.

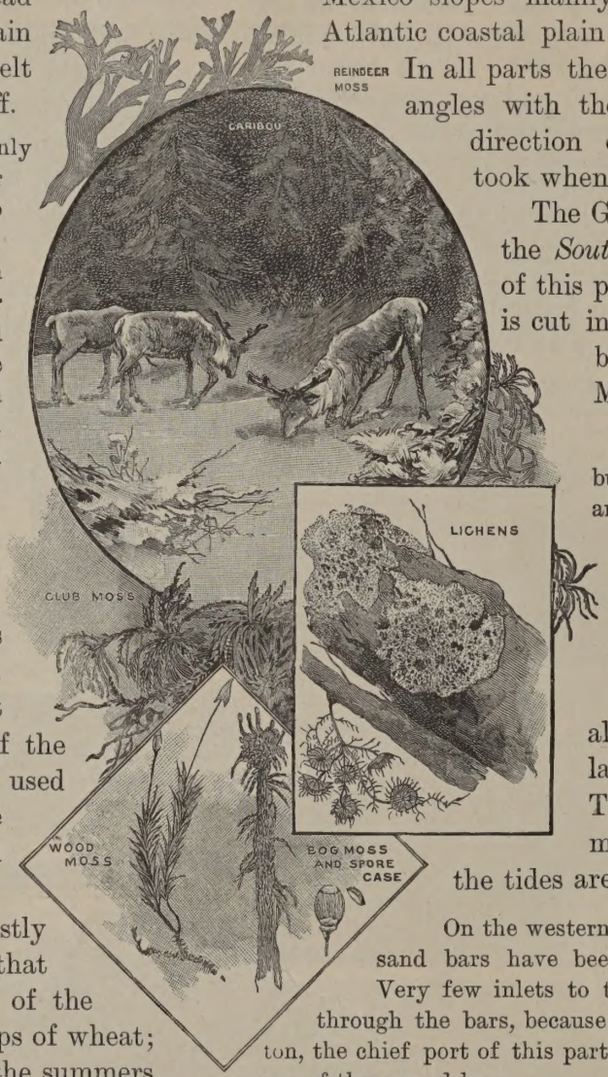
The Northern plain of North America extends from the prairies to the Arctic coast, and lies mostly in the cold belt. The summers are short; the winters are long and severe. Near the Arctic shore, the daylight of summer is continuous for six or eight weeks. The darkness of winter lasts for an equal length of time.

In the far north the soil is frozen to a great depth. In summer it thaws for only a few inches below the surface. The region is cold and desolate nearly all the year.

Along the Arctic shore there are low and level plains, called *tundras*, from seventy to one hundred miles wide. During the short summer these plains become swampy, and are then covered with mosses and lichens, rushes and ferns, as well as with several kinds of small flowering plants, but there are no forests in the tundras.

The Mackenzie river flows from the cool belt far into the cold belt. When the spring thawing begins in the southern part of the Mackenzie basin, the water runs northward till checked by the ice which at that time clogs the channels. The streams then spread far over their flood plains, which remain covered till the ice-jams in the north melt away and allow the flood-water to run off.

Floods of this kind occur each year, not only in the Mackenzie basin, but also in every river valley whose main stream flows northward into the Arctic ocean.



Large herds of reindeer, called *caribou*, roam over the cold plain in the far north. In summer they feed on the lichens, mosses and stunted shrubs which grow along the shores of the Arctic ocean. Many thousand caribou live in the so-called *Barren Lands* west of Hudson bay. As the cold season approaches, the deer travel southward into forest regions where they can find food and shelter.

Small tribes of Indians live on the bleak Northern plains, and small bands of Eskimos are found along the shores of the Arctic ocean and Hudson bay. To these people, the deer are of great value. The flesh of the caribou is one of the chief sources of food, and the skins are used in making clothing and tents. Even the bones are shaped into simple tools and weapons.

The basin of the Nelson river is mostly in the cool belt. The southern part of that basin includes the wide fertile prairies of the Red river valley, — famous for their crops of wheat; for although the winters are very cold, the summers have long days of strong sunshine, and plants grow there very rapidly.

It is chiefly from this broad interior region that the eastern and southern parts of our country receive cold winds in winter. In that season the wide cover of snow over the interior plains becomes intensely cold. The lower air is then greatly cooled and tends to flow outward to the warmer regions.

The cold waves are especially severe when one of the whirling westerly storms moves to the Appalachian highland, and the cold winds flow rapidly southward behind it. Freezing air may then be carried even to the gulf of Mexico and to the southeast coast of our country.

Arctic Ptarmigan.

The western and northern parts of the Nelson basin are thinly settled. They are forested and abound in many kinds of fur-bearing animals, such as beavers, otters and ermines.

Several large lakes extend northwestward in the basins of the Nelson and Mackenzie rivers. These bodies of water, together with the Great Lakes, form a remarkable chain stretching along the south and southwest borders of the old Laurentian highland.

53. Gulf Coastal Plain.

The broad lowland which follows the seacoast from the Rio Grande to the Hudson river[1] forms one great coastal plain. The part which borders on the gulf of Mexico slopes mainly towards the south, but the Atlantic coastal plain slopes towards the southeast. In all parts the streams flow mostly at right angles with the coast, because that is the direction of the slope which the land took when it rose from the sea.

The Gulf coastal plain is known as the *Southern plain*. The greater part of this plain is low rolling upland. It is cut into eastern and western parts by the wide flood plain of the Mississippi river.

The part near the shore is young, but farther inland the plain is older and much worn by streams that have extended their courses across it from the higher and older interior.

A large part of the Gulf coast is low, sandy and barren. The shallow waters along the shore afford few landing places for large vessels. The harbors are at the river mouths or as far upstream as the tides are felt.

On the western side of the gulf of Mexico, long sand bars have been formed offshore by the waves. Very few inlets to the inclosed lagoons are held open through the bars, because the tides there are weak. Galveston, the chief port of this part of the coast, is built on the end of one of these sand bars.

The Southern plain is in the warm belt and receives heavy rainfall from moist winds that blow from over the gulf of Mexico. The summers are long and hot; the winters are short and mild, except in the northern portion. Near the Gulf coast, frosts are rare and snow is almost unknown.

It is from this region and from over the warm waters of the gulf of Mexico that the "hot waves" of summer are chiefly drawn to the upper Mississippi and Ohio valleys. These hot waves are southerly winds drawn inland on the front of advancing whirls in the westerly winds. The dampness of the Gulf winds makes their heat the more oppressive.

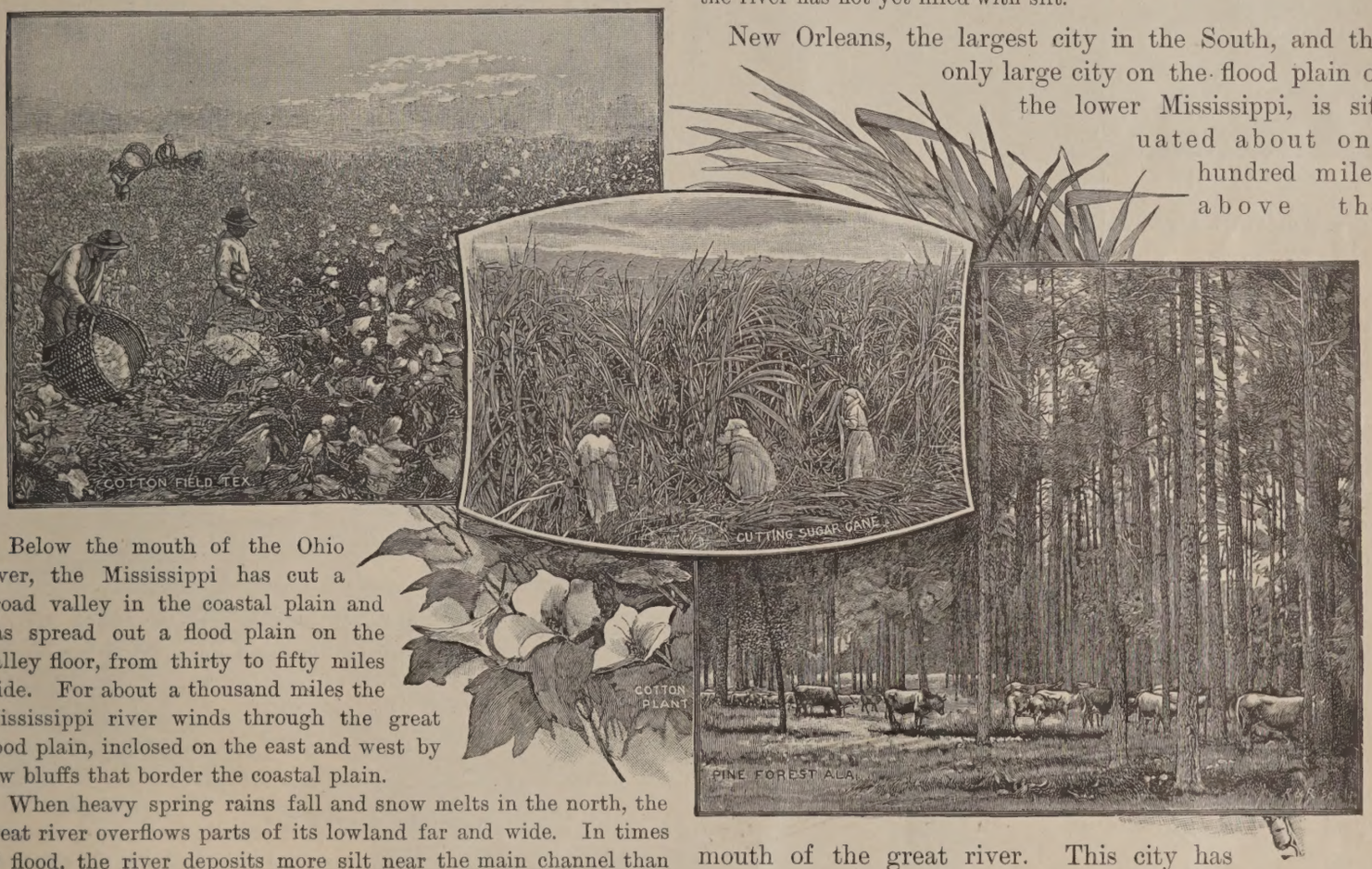
Nearly all parts of the Southern plain were at one time wooded, and forests still cover the greater portion of the region. Pine lumber is a valuable product of these forests.

[1] Long Island, Cape Cod, and the lowland east of Mexico, form narrow extensions of this great coastal plain.

Large districts in the South have been cleared of trees and now rank among the most productive parts of our country. Cotton is the leading crop on these cleared lands.

The cotton plant needs very long and hot summers to ripen its seeds and to produce the fiber which grows around them. Cotton fiber is made into cloth, thread and rope. In a later lesson we shall learn much more about this useful plant.

Rice thrives on low flood plains and on the swampy borders of lagoons behind coastal sand bars. At times the rice fields must be flooded to make the plants grow.



Below the mouth of the Ohio river, the Mississippi has cut a broad valley in the coastal plain and has spread out a flood plain on the valley floor, from thirty to fifty miles wide. For about a thousand miles the Mississippi river winds through the great flood plain, inclosed on the east and west by low bluffs that border the coastal plain.

When heavy spring rains fall and snow melts in the north, the great river overflows parts of its lowland far and wide. In times of flood, the river deposits more silt near the main channel than farther away, and the surface of the flood plain therefore slopes gently *away from* the river.

The small rivers coming from the coastal plain into the flood plain of the Mississippi cannot keep their course up the gentle side-slopes of the flood plain to the main river, so they turn down the valley, near the bluffs. One of these rivers, the Yazoo, is shown on the relief map on page 32.

Banks of earth, called *levees*, have been built for hundreds of miles along the great river, to keep the rising water from flooding the fields. In times of heavy floods the levees are often broken; and as the flood plain slopes away from the river, the lowlands are quickly flooded. Thousands of acres of cotton, sugar cane and grain are then destroyed. A break in the levee is called a *crevasse*.

Villages on the flood plain are often built close along the river banks, where there is the least danger from floods, because the banks are the highest parts of the flood plain.

The Mississippi river meanders, or flows in long bends or loops, in the flood plain. Year after year the river wears away the necks of the loops, now and then cutting across one of them. Then the stream flows in its new channel, and the deserted part is left filled with standing water, forming a curved lagoon. Many lagoons on the wide flood plain show former courses of the river.

For ages the Mississippi river has carried down large quantities of silt and built its flood plain far out into the gulf of Mexico, making a great delta. Every minute this broad stream carries into the gulf of Mexico enough silt to fill an ordinary schoolroom.

The low delta plain comprises thousands of square miles. Many parts are marshes and wooded swamps. Other parts are wide stretches of grass land. Many distributary streams cross the delta, and a large number of lakes lie in shallow hollows between them. Between the mouths of the distributaries are large salt bays that the river has not yet filled with silt.

New Orleans, the largest city in the South, and the only large city on the flood plain of the lower Mississippi, is situated about one hundred miles above the mouth of the great river. This city has a large trade in cotton, sugar, rice and other products of the Southern plain. Several other cities, such as Memphis and Vicksburg, are built where the Mississippi river flows past the bluffs. These river ports are important cotton markets.

54. Atlantic Coastal Plain.[1]

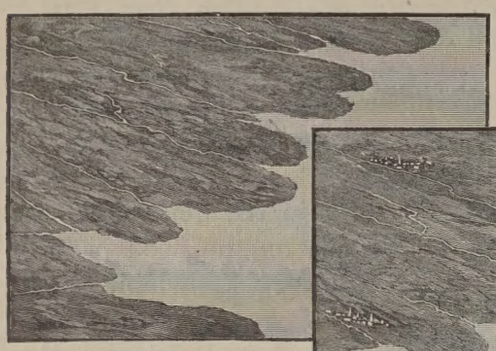
Southeast of the piedmont belt lies the Atlantic coastal plain. As in the Gulf coastal plain, the region near the sea is young and smooth, while the plain farther inland is older and is more deeply and widely cut by streams that flow across it from the Appalachian highland.

The widest part of the Atlantic coastal plain is southeast of the Carolina highland. Thence the plain narrows

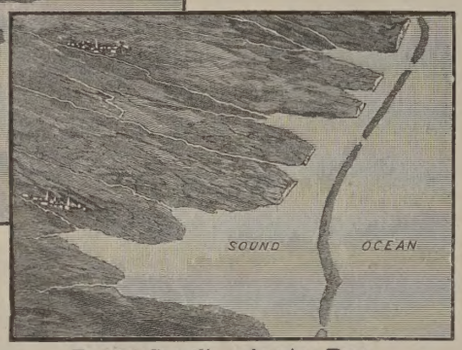
[1] Teachers who so prefer will find no difficulty in going from this lesson directly to the later lessons on the United States, — its people, resources, commerce, etc. Most teachers, however, will doubtless continue to present the topics in the order in which they appear.

northeastward to the mouth of the Hudson river, where the piedmont belt reaches the coast.

The southern part of this coastal plain is in the warm belt and has seasons like those of the Gulf coastal plain. The northern part of the Atlantic coastal plain has the seasons of the cool belt. Southeast winds from over the warm Gulf stream help to make the winters of this coastal plain milder than those of the inland regions in the same latitude.



Former Coastline.



Recent Coastline showing Bars.

The long Atlantic coastal plain has plenty of rainfall. It is brought by winds from over the gulf of Mexico and the Atlantic ocean.

The higher and older part of the coastal plain, where the rivers have worn wide valleys and made fertile flood plains, is rolling or hilly. The southern half of this upland country, like the piedmont belt which adjoins it, is famous for its cotton crops. Farther north, tobacco is a leading crop of the uplands and the piedmont. The soil is also suited to the growth of grain.

In the lower and younger part of the coastal plain, where the land is flat and little worn, the rivers are sluggish.

Large parts of the younger coastal plain are covered with forests of pine. These yield turpentine, rosin and lumber. This lower part of the plain is also noted for its fruit groves, — oranges in the south and peaches in the north. Great quantities of early vegetables are raised in the younger coastal plain and are shipped mostly to the large northern cities.

When the smooth sea-bottom was lifted up to form the Atlantic coastal plain, it made a very regular coastline. Since valleys were worn in the plain, the northern and middle portions have partly sunk beneath the sea, drowning the lower parts of the valleys and thus making bays with excellent harbors. Among these are New York, Delaware and Chesapeake bays. Near the heads of these bays are situated the great ports of New York, Philadelphia and Baltimore.

Several large cities are built on the rivers along the line where the piedmont belt meets the coastal plain. The rivers are there broken by falls or rapids that give fine water power. In the northern and middle ports of the coastal plain, where the valleys have been slightly drowned, the larger streams, as far as the falls, are open to vessels from the sea. Richmond, near the lower falls of the James river, is a good example of this class of cities.

In the southern part of the plain, the land slopes so gently under the sea that good harbors are found only in the river mouths. Sand bars, built by waves, lie along the coast and partly inclose many sounds. Inlets through the sand bars are kept open by tidal currents.

The best cotton in the world grows on some of these border islands and on the shores of the mainland near by. The soil is sandy, but the plants which grow in it produce long and fine fibers.

Large quantities of rice are raised in the wet lands in the warmer parts of the Atlantic coastal plain, as well as in the Gulf coastal plain. This grain thrives in lagoon swamps inside the sand bars, and in river swamps which at certain times can be flooded or drained.

Rice Culture.

Charleston and Savannah are important ports for cotton, rice and pine products. These cities are on tidal rivers and have good harbors.

The peninsula of Florida, lying between the gulf and the ocean, is chiefly a coastal plain formed by the uplifting of the sea-bottom, but partly also the work of coral polyps. Tiny creatures of this kind, in countless numbers, are still very active in building the southern portion of the peninsula farther out into the warm Gulf stream.

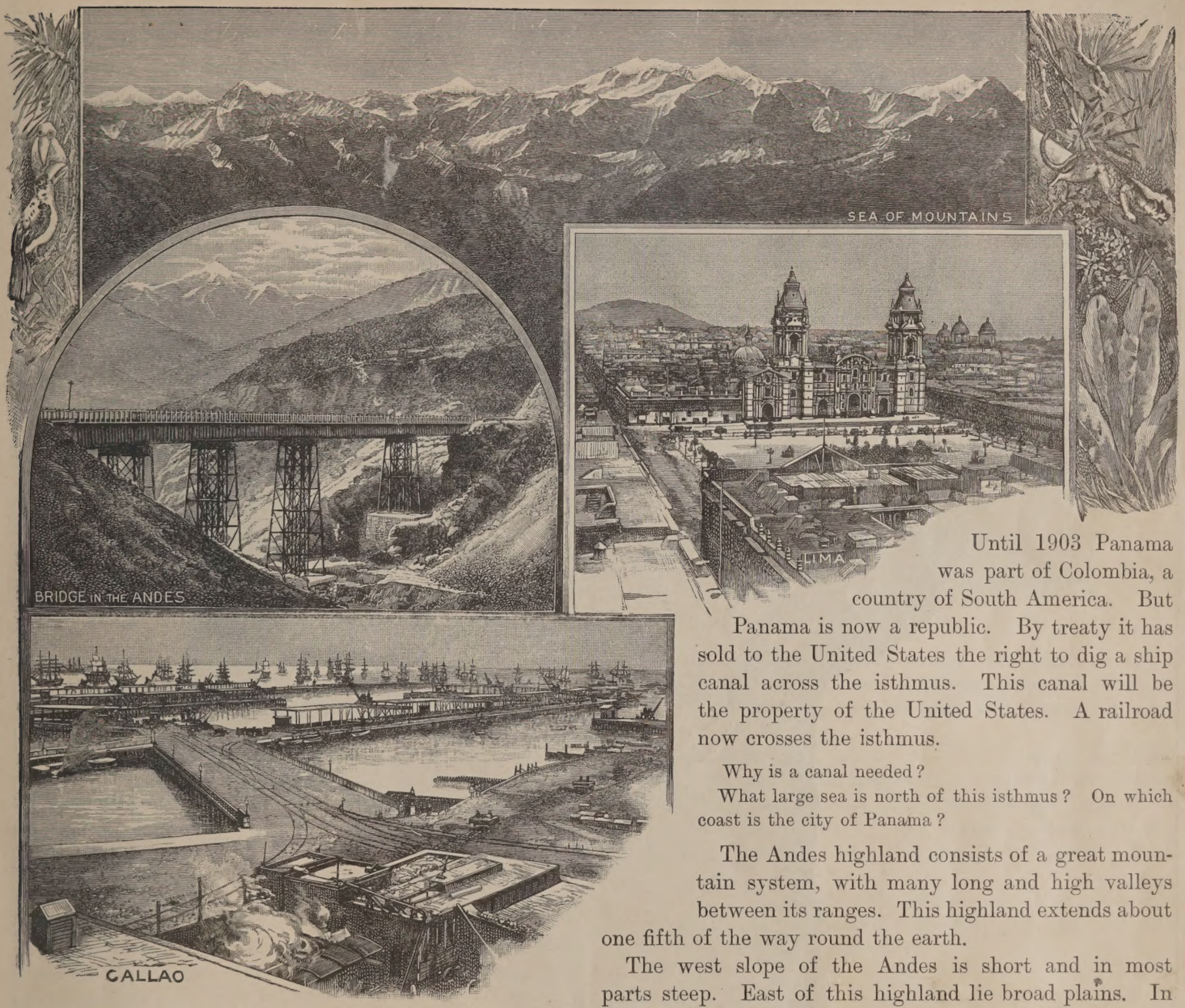
Southeast of Florida lie the low Bahama islands.[1] These consist mainly of huge banks of shell and coral limestone. Only small parts of the great banks rise above the sea.

The islands of the West Indies are mostly the upper portions of mountainous country that has been partly drowned. The flooded valleys in this region form many large and deep harbors.

The city of Havana, on one of these drowned valleys, is the chief port of Cuba and the largest seaport in the West Indies.

Many of the small islands of the West Indies stretching in a chain to the northern coast of South America are almost wholly volcanic. *See Supplement for full text on West Indies.*

[1] Neither the Bahamas nor the West Indies are parts of the coastal plain, but owing to their position they may be studied here.



Until 1903 Panama was part of Colombia, a country of South America. But Panama is now a republic. By treaty it has sold to the United States the right to dig a ship canal across the isthmus. This canal will be the property of the United States. A railroad now crosses the isthmus.

Why is a canal needed?

What large sea is north of this isthmus? On which coast is the city of Panama?

SOUTH AMERICA.

55. South America.[1]

South America is not so large as North America. Both these continents have the same general outline, narrowing towards the south.

The two lands resemble each other in their relief or surface forms. Each has a long western highland and also a great central plain, with lower eastern highlands.

The isthmus of Panama joins the two parts of America. Along this neck of land, the primary highland consists of a hilly ridge. Passes among the hills are only about three hundred feet above sea level.

[1] The *Map Studies* on page 55 are to precede this lesson. Refer often to the relief maps. Locate every place named in the text.

The Andes highland consists of a great mountain system, with many long and high valleys between its ranges. This highland extends about one fifth of the way round the earth.

The west slope of the Andes is short and in most parts steep. East of this highland lie broad plains. In the valley of the Amazon are the *selvas*, or *forest* plains. Other parts of the plains are grass lands.

The great plains are broken on the northeast by the highland of Guiana, and on the southeast by the highland of Brazil. These are much lower than the Andes.

The north and middle parts of South America are in the trade wind belts and therefore have frequent rains wherever these winds rise over the mountains. The equatorial rain belt also shifts north and south across the northern half of the continent.

The southern part of the continent reaches far into the cool belt, in the path of the stormy westerly winds.

The warm equatorial currents of the Atlantic, moving westward under the trade winds, divide on the eastern point of South America and sweep along the northeast and southeast coasts.

South America extends far into the southern ocean and turns a great volume of cold water northward along the west coast. The winds which blow ashore from over this current are cold in the south, but become warmer towards the equator.

RELIEF MAP OF SOUTH AMERICA.

56. Map Studies.[1]

In what direction is South America from North America? What Isthmus unites these continents? What oceans lie east and west of both?

On which side of the equator is the greater part of South America? Over which part of this continent does the belt of equatorial rains shift north and south? Which part is in the belt of westerly winds?

In what direction does the Andes highland extend? Which coast does it follow? Which part of the highland looks the highest? The widest?

Compare the Andes highland and the Rocky mountain highland as follows: Which is the higher? The longer? The wider? In what respects are they alike?

Where is the plateau of Bolivia? What lake is on this plateau?

Where is the highland of Brazil? Compare it with the Andes highland, in length; in width; in shape. Compare the Brazilian and Appalachian highlands in width and shape.

[1] In the *Supplement* there is a *guide map* for drawing and modeling. Read the *note* on page 29.

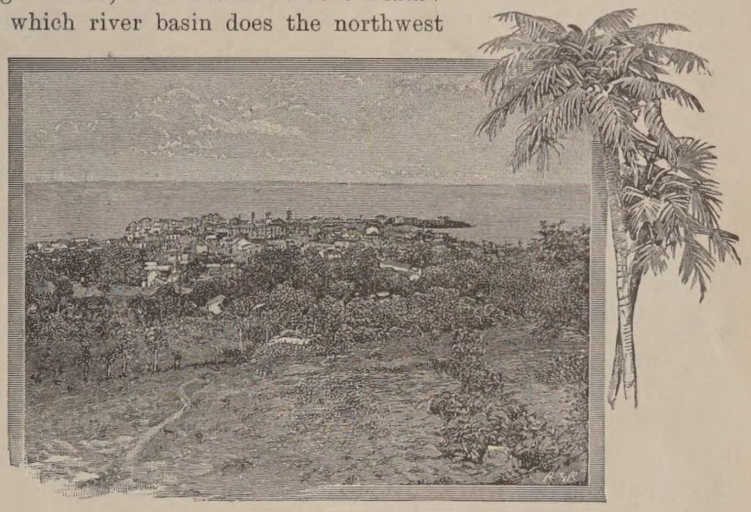
Where is the Guiana highland? Is it larger or smaller than the highland of Brazil?

On which side of the Andes is the great plain of South America? What highlands are on the northeast and the southeast?

Describe the course of the Amazon river. In which heat belt does the greater part of the Amazon basin lie?

Where is the Plata river? Which river system drains the larger basin, the Amazon or the Plata?

To which river basin does the northwest slope of the Brazilian highland belong? The southwest slope? Which part of the central plain is drained by the Orinoco river? What highland partly separates the basin of the Orinoco from that of the Amazon?



City of Panama.

Compare the central plains of North America and South America, as follows: What large river system drains the southern part of each? The northern part? The north-central part?

Draw the general outline of South America, — using only three straight lines. State the general direction of each coast. Which is the longest?

Sketch the Pacific coast of all America. *See guide maps in the Supplement.* Which is the more regular, the west coast of North America or that of South America?

Sketch the north coasts of both continents. Which of these coasts is the more irregular? Which is in the colder belt? Sketch the east coast of all America. Compare the two parts.

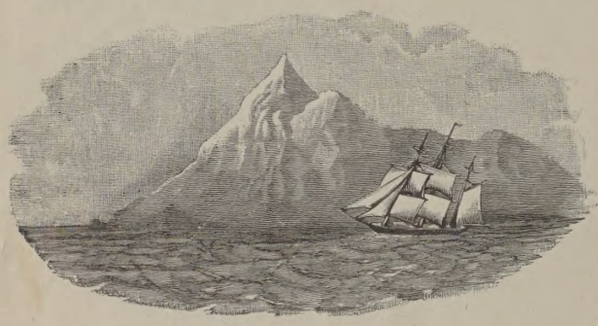
Where is the Caribbean sea? Name a river flowing northward into this sea. Where is the San (or São) Francisco river?

57. The Southern Andes.

The southern portion of the Andes has partly sunk beneath the sea. Many fiords now occupy deep valleys worn in the western slope. Ridges and peaks that the sea did not entirely cover form a fringe of islands.

Cape Horn is on one of these rocky islands, at a little less than two thirds of the distance from the equator to the south pole.

Near cape Horn the sea is often made very rough by the stormy westerly winds. For this reason, steamships go through the strait of Magellan, instead of rounding the cape. Small bands of Indians, known as *Fuegians*, live on the islands south of the strait.



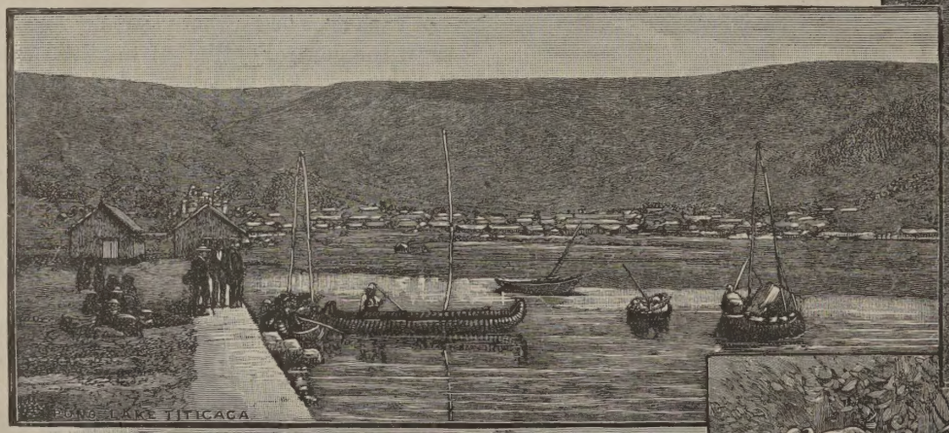
Cape Horn.

About halfway between cape Horn and the sharp bend in the Pacific coast, the Andes chain is very high. Some of the peaks are more than four miles above sea level and are white with snow all the year.

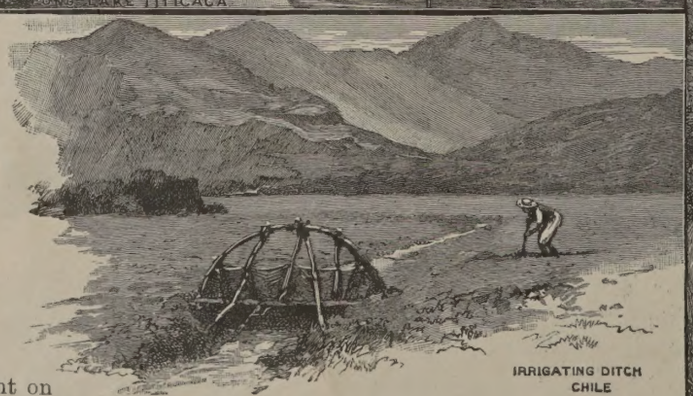
West of this part of the Andes lies the long and narrow plain of middle Chile. The land near the sea is rugged but not very high. The plain is between this rough coast land and the Andes.

We have learned that the belt of westerly winds moves north and south with the sun. In the cold season these winds blow nearer the equator than in the hot season.

The plain of Chile, like the valley of California, is crossed by the stormy westerly winds in winter, but in the summer season these winds move farther from the equator, beyond both these regions. The cold months therefore form the wet season. Owing to the winds from over the cold ocean current on the west, Chile has no very hot season.



RUINS LAKE TITICACA



IRRIGATING DITCH CHILE

The rivers which cross the plain of Chile are short. In times of heavy rain and thaw they overflow parts of the plain and deposit fine soil for the next season's crop of wheat, barley and corn. In the hot months, when the westerly winds move away to the south, the streams are fed by snow melting on the high slopes of the Andes. A large amount of the river water is turned into canals and ditches to irrigate the grainfields and vineyards. Valparaiso is the chief port in Chile.

Below the snow line the west slope of the southern Andes is heavily wooded. Among the trees are pine and oak.

The mountain pass shown in the picture below is not far from the volcanic cone of Aconcagua. This pass is two miles and a half above sea level, — higher than many clouds. In some parts, long slopes of coarse rock waste rise on either side, and there is neither water nor fuel.

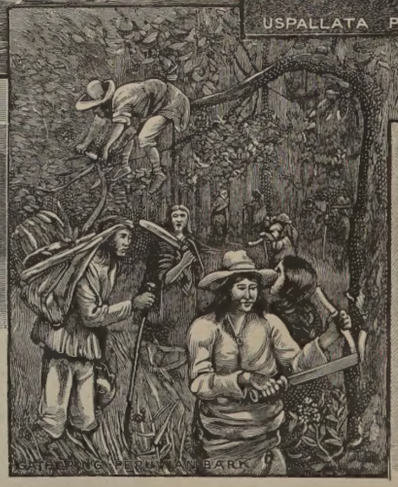
Years ago the journey across this highland was made on mules or on horses. A railroad now crosses the Chilian Andes.

There are many volcanoes in this region, and earthquakes are frequent.

58. The Middle Andes.

The plateau of Bolivia lies in the widest part of the Andes. It is the highest plateau in America and is shut in both on the east and the west by lofty ranges. The plateau of Bolivia averages about 12,000 feet in height. It is three times as high as the Great Basin in North America.

USPALLATA PASS



GATHERING PERUVIAN BARK

A BOLIVIAN

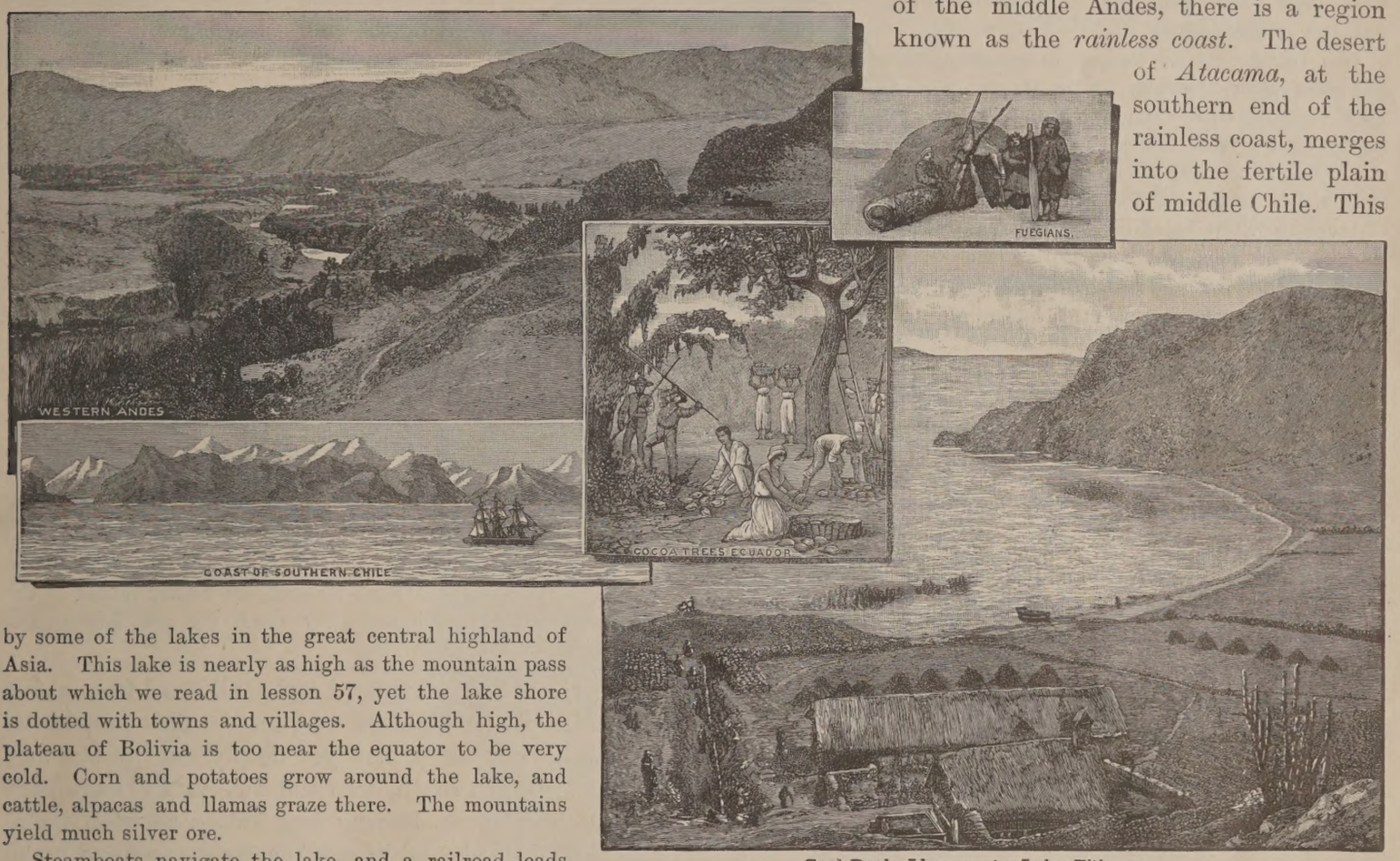
On the plateau of Bolivia there is a large sheet of water, known as *lake Titicaca*. This lake has an outlet which carries a small portion of the water southeastward, but much of the water

evaporates and the lake is therefore slightly brackish. The outlet does not reach the sea but flows into a salt swamp.

Lake Titicaca is in the northern part of a region having no drainage to the sea. This region extends southward into Patagonia.

Titicaca is the largest lake in South America and is the loftiest large body of water in the New World. It is only surpassed in height by some of the lakes in the great central highland of Asia. This lake is nearly as high as the mountain pass about which we read in lesson 57, yet the lake shore is dotted with towns and villages. Although high, the plateau of Bolivia is too near the equator to be very cold. Corn and potatoes grow around the lake, and cattle, alpacas and llamas graze there. The mountains yield much silver ore.

Steamboats navigate the lake, and a railroad leads down to the coast. The steamers and cars connect at the town of Puno which is shown in one of the pictures on the opposite page.



Coal Dock, Llampopata, Lake Titicaca.

Northwest of Bolivia the plateau is neither so wide nor quite so high. In the Andes of Peru, the ranges on the east are separated by long and deep valleys in which many rivers flow to the lowlands. The rains of the trade winds are very heavy on this eastern mountain slope which is therefore covered with dense forests.

Many years ago a band of white men from Spain, in Europe, went into the highland of the middle Andes. They found there a race of Indians whose rulers were called *Incas*, and the same name was given to all the people who were ruled by the Incas.

The Indians had cities built of hewn stone, and their roads and bridges were better than any that the Spaniards who went there could make. Cuzco was the chief city of the Incas, and it still contains ruins of their beautiful stone work.

The Spaniards were very cruel to the Indians and made slaves of them. The descendants of the Incas still live on the highland, but white men are rulers of the whole land.

Have you ever tasted quinine, — a bitter medicine that is often used to cure fevers and colds? It is made out of the bark of cinchona trees. These grow wild in forests on the east slope of the middle Andes, and have been transplanted into other warm lands.

Much of the bark is stripped from trees. Some of it is also taken from slender shoots that spring up from the roots of trees which have been cut down. The descendants of the Incas gather large quantities of the bark.

For more than a thousand miles along the west slope of the middle Andes, there is a region known as the *rainless coast*. The desert of *Atacama*, at the southern end of the rainless coast, merges into the fertile plain of middle Chile. This desert is at the northern end of the country of Chile.

Although close by the sea, the slope descending to the rainless coast is barren except in the flood plains of several small rivers. This region, like the dry west coast of Mexico, is too near the equator to feel the storms of the westerly winds and is not near enough to the equator to receive rain from the shifting equatorial rain belt.

The small rivers of the west slope are fed by rain and by snow melting on the high parts of the ranges which are reached by trade winds from over the Atlantic.

59. The Northern Andes.

In the northern part of the Andes are many high and wide valleys, walled in by mountain ranges. Some of these valleys are covered with coarse wash from the mountains and are dry and barren. Others are coated with fine soil, largely made of weathered volcanic ash. One of the most noted of these high valleys is that of Quito, a little less than two miles above sea level.

The valley of Quito is in the midst of one of the most noted groups of volcanoes in the world. There are cones so old that

their sides are deeply cut by streams, and cones smooth with recent flows of lava and showers of ashes.

Some of the volcanoes are very active. Cotopaxi, about twice as high as the plain of Quito, is the loftiest *active* volcano known. The summit of this great cone is buried in snow and is often hidden by clouds. Another famous peak is Chimborazo. This giant cone is higher than Cotopaxi but is not active.

One volcano, named *Sangay*, in this group is the most active known. It throws out a jet of lava four or five times an hour. The stream rises several hundred feet into the air. Once in a while a larger stream of molten rock is belched forth to a height of more than one third of a mile. The country is shaken, and sounds like the heaviest thunder are heard.

Many earthquakes occur in this volcanic region. For this reason most of the houses are built low and flat. They are made chiefly of sun-dried bricks. During one earthquake, about a century ago, forty thousand people are said to have been killed in Quito.

Condor.

In the extreme north the Andes divide into three main ranges. The western range is not very high and it ends near the isthmus of Panama. The middle chain runs almost due north. The eastern range curves for some distance along the northern coast.

The long valleys east and west of the middle chain are drained by the Magdalena river and its branches. The Magdalena river is the chief water way in Colombia and is navigable for many miles from the sea.

Chimborazo.

Many cities and towns have been built in lofty valleys among the northern Andes. These valleys, although near the equator, are too high to be very hot.[1] The climate of the low coast region is hot and unhealthful. The coast towns serve as ports for the upland cities.

The great vulture called the condor is often seen high up among the Andes. This huge bird, the largest that flies, lays her eggs on bare crags where they are generally safe from enemies.

The condor is so strong that it often kills sheep, young llamas and other animals. For this reason, the people who live in the lofty Andean valleys are glad when one of these birds is slain.

The northern Andes are in the belt of equatorial rains. The eastern slope, which receives the rains of the trade winds, contains the sources of many large rivers. From the western slope, several smaller streams flow into the Pacific. There are forests on both sides of the highland, but those on the east are much the denser, as the rainfall is there so heavy. On the western coast, the equatorial rain belt does not shift very far south, because the heat equator is there pushed northward by the cool ocean current.

[1] Near the strait of Magellan the snow line is only half a mile above sea level. Towards the north the snow cap shrinks farther away from the lower level, till near the equator it is three miles high. The parts of the ranges above the snow line are dreary wastes of snow and ice.

60. The Highland of Brazil.

The highland of Brazil is shaped like a triangle, with one side lying along the east coast This coastal part is the highest. As a whole, the highland of Brazil is only about one sixth as high as that of the Andes, or about equal to the Appalachian highland.

The coast ranges of Brazil turn many river branches inland. These streams reach the sea by flowing round the ends of the ranges. Thus the San[1] Francisco river winds northward through a wide valley a thousand miles long, before it finds an opening to the sea. Other streams are turned inland by the coast range farther south, and they reach the sea through the broad mouth of the Plata river.

Long rivers flow northward and southward from about the middle of the highland of Brazil. This part of the highland is a plateau, not yet deeply cut by streams. Farther north and south, deep and wide valleys have been worn in the plateau, leaving long ridges between them. Rapids and falls abound in most of the streams and make them unfit for water ways.

The coast of this highland region is not broken by long bays. The best harbor is that of Rio de Janeiro. It is deep and broad, and ranks among the finest in the world. Rocky reefs help to form harbors in some places along the coast of Brazil. *See picture below.*

A large part of the highland of Brazil is reached by the equatorial rain belt. The hot months therefore form the wet season. In the dry season, there are heavy night dews, with occasional rains from the trade winds as they rise over the highland.

Harbor of Pernambuco.

[1] The English form of the Portuguese word São is San.

Towards the coast, dense forests cover large areas in this highland. In the inland region, where the rainfall is lighter than it is near the coast, there are wide grassy plains known as the *campos*. Herds of cattle graze on the campos.

Many useful plants are raised on the highland, — chiefly in the rainy eastern part. Among these are coffee, sugar cane, cotton and cassava.

Coffee is the leading product in this region. The coffee trees or shrubs thrive in lands having warm weather all the year, with plenty of rain. In Brazil they grow best on the plateau and the slopes of low ranges, at quite a distance from the sea.

Each coffee berry has two seeds. These are roasted and ground, before being used.

Rio de Janeiro is the greatest coffee market in the world.

There are two species of cassava plant, — the bitter and the sweet. From the roots of these plants many kinds of food are made by the white people, the Negroes and the Indians of Brazil.

Roots of bitter cassava contain a deadly poison, but this is driven out by grating, pressing and baking. Tapioca is made from this root. Cassava is one of the chief articles of food used by poor people in Brazil.

61. The Guiana Highland.

On the northeast the great plain of South America is broken by the Guiana highland.

This highland is for the most part a much-worn plateau, with flat-topped hills and mountains rising in high cliffs from wide valleys. One of these table mountains, near the central part of the highland, rises about a mile and a half above sea level, but most of the peaks are not half so high.

This highland is reached by the equatorial rains and therefore has its wettest season during the hot months. In all seasons, the highest portions are well watered, for the trade winds give out rain as they rise over the highland.

On the north of the Guiana highland lies a wooded coastal plain. Large swamps that extend along the shore are the home of many alligators. The slope passes so gently under the sea that at low tide wide tracts of sand and mud are laid bare.

Much of the south slope of the highland consists of rough hills and bare rocky valleys, for the winds from the sea give their rains mostly to the northern slopes.

Find on the map the Essequibo river. This stream flows from the plateau through a dense forest and is noted for its grand cataract. The river has cut a long gorge about an eighth of a mile deep, into the head of which the water now plunges.

62. The Selvas.

The slopes east of the crest of the Andes are mainly in three great river basins. The divides between these basins cross the highlands of Brazil and Guiana, and the lowlands farther inland.

The Amazon basin is between the other two. The highest parts of its long slope are in the Andes. The lowest parts are coastal swamps, more than two thousand miles east of the snowy peaks. The side slopes descend from the highland of Brazil on the south, and that of Guiana on the north.

The Amazon basin is the largest in the world. It comprises about one third of the continent.

This basin is in the equatorial rain belt and its rainfall is very heavy. The Amazon river carries more water to the ocean than any other river in the world. Its muddy water is seen at sea for a great distance from land.

Some branches of the Amazon rise in the Andes, and the water which follows the winding banks down from these sources to the mouth flows about four thousand miles.

The nearest approach of the Amazon basin to the Pacific ocean is the source of the Paute river, in Ecuador, only about *thirty* miles east of the gulf of Guayaquil. No other river in South America, flowing to the Atlantic ocean, rises so near the Pacific coast.

The main branches of the Amazon are the Madeira river on the south and the Negro river on the north.

Large steamers go up the Amazon from the sea to the foothills of the Andes. For great distances many of the tributaries are deep, wide, and free from rapids. The length of navigable streams in the Amazon system is greater than the distance round the earth.

Part of the wide mouth of the Amazon has so strong a tidal wave, or bore, that boats cannot outride it. No towns are situated on the shore swept by this tidal wave.

This is one of the great rivers which make flood plains. For this reason the lowlands are nearly level, — sloping only a few inches to the mile. The streams there are sluggish and the silt which they carry is very fine. In the rainy season the rivers in the lowland generally rise thirty or forty feet and spread far and wide over the flood plain.

Dense forests, called *selvas*, cover the lowlands of the Amazon basin. Long vines hang from the trees, and

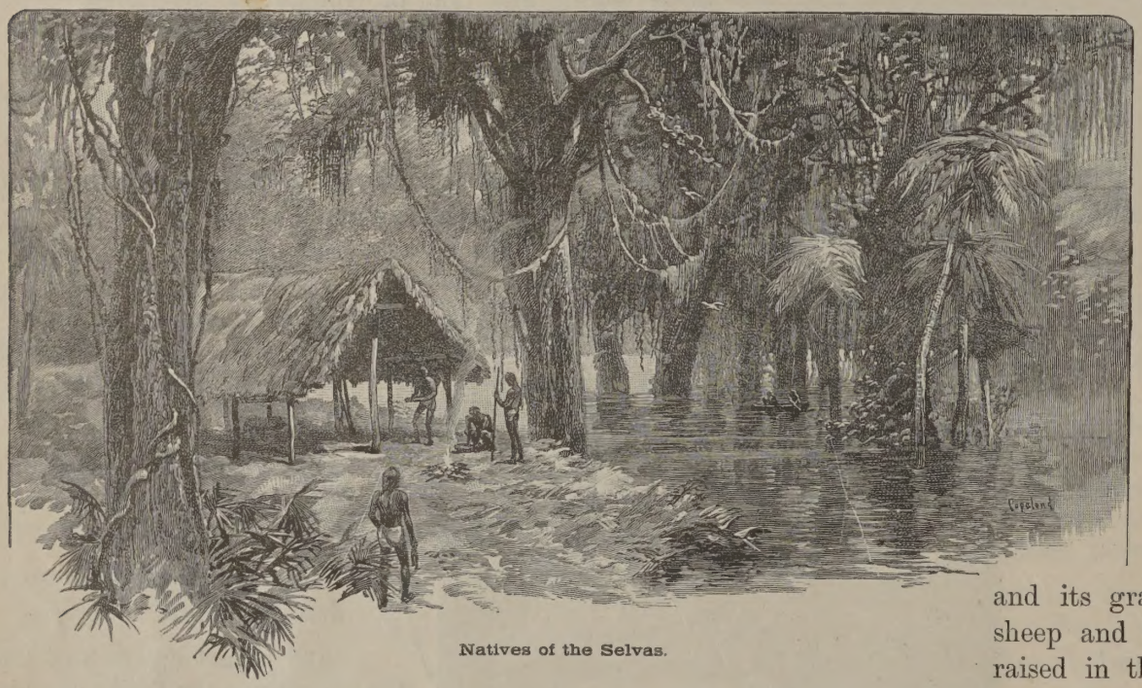
reeds and rushes grow in the wet soil, forming a network so thick in some places that one cannot pass through without first cutting a path.

Tree ferns and palms in great variety grow in the selvas. Many beautiful birds live among the high tree tops.

Lesson 113 describes some of the large animals of the selvas and of other parts of South America. Perhaps you would like to read that lesson, but you need not study it at present.

Many small tribes of Indians live near the banks of the streams. These natives catch fish in the rivers, and animals in the forest.

Large rubber trees grow on the hot and damp banks of the Amazon. Deep cuts are made in the bark, and cups are placed beneath them to catch the milky juice which oozes out. When heated in certain kinds of smoke, this juice dries, thickens, and forms rubber of a fine quality.



Natives of the Selvas.

Another kind of rubber tree grows on the plateau of Brazil. The outer layer of bark is stripped off to the height of about five feet from the ground. The sap then runs out and hardens on the tree. After a few days this rubber sap is ready for market.

India rubber is made from the sap of many kinds of trees and shrubs that grow in nearly all hot and damp parts of the earth. Name some of the uses of rubber.

Rosewood trees also grow in the selvas. The color of the wood is deep red-brown, with streaks of dark resin.

Piano cases, chairs and tables are often carved in rosewood, because it takes such a fine polish. Wood that is used in making choice furniture is called *cabinet wood.* Many kinds of trees in Brazil supply cabinet wood.

Several species of trees that abound in the selvas yield dyes. Among these are logwood trees. Thin chips are cut from the trees and are kept moist. Green crystals form on the chips, and these crystals are used in dyeing cloth.

Dyes of various kinds are made from logwood. Some of these are used to give the color in blue woolen cloth, purple calico, and black prints.

Para, being near the mouth of the Amazon, has a very large trade in rubber and other products of the selvas.

63. The Gran Chaco and the Pampas.

South of the Amazon basin lies the Plata basin. It reaches from the crest of the Andes on the west to the crest of the coast range on the east.

This basin is about one half as large as that of the Amazon. The main stream is the Parana river which flows into the broad Plata river.

The lowland of the Plata basin is a young plain in which the rivers have cut only narrow and shallow valleys. The northern part of this plain is called the *gran chaco*, or *great hunting ground.* South of the chaco the plain takes the name of *pampas*, meaning *fields.* The pampas extend also far south of the Plata basin.

We have read about the winter rains on the plain of Chile. At that time the valley of the Plata has its dry season. In summer, when the belt of westerly winds moves southward, moist northeast winds from over the Atlantic bring the wet season to the chaco and the pampas. The interior parts of these regions are so far from the sea that their rains are not heavy.

Deep rich soil covers large portions of the Plata plain, and its grass feeds millions of cattle, sheep and horses. Much grain also is raised in this region. In some places there are clumps of tall coarse grass covered with soft plumes. This is known as *pampas grass.*

The grassy plains merge into forest land on the north, into long plains of gravel on the south, and into salty plains and brackish marshes on the west. These marshes lie between low ranges rising from the plain.

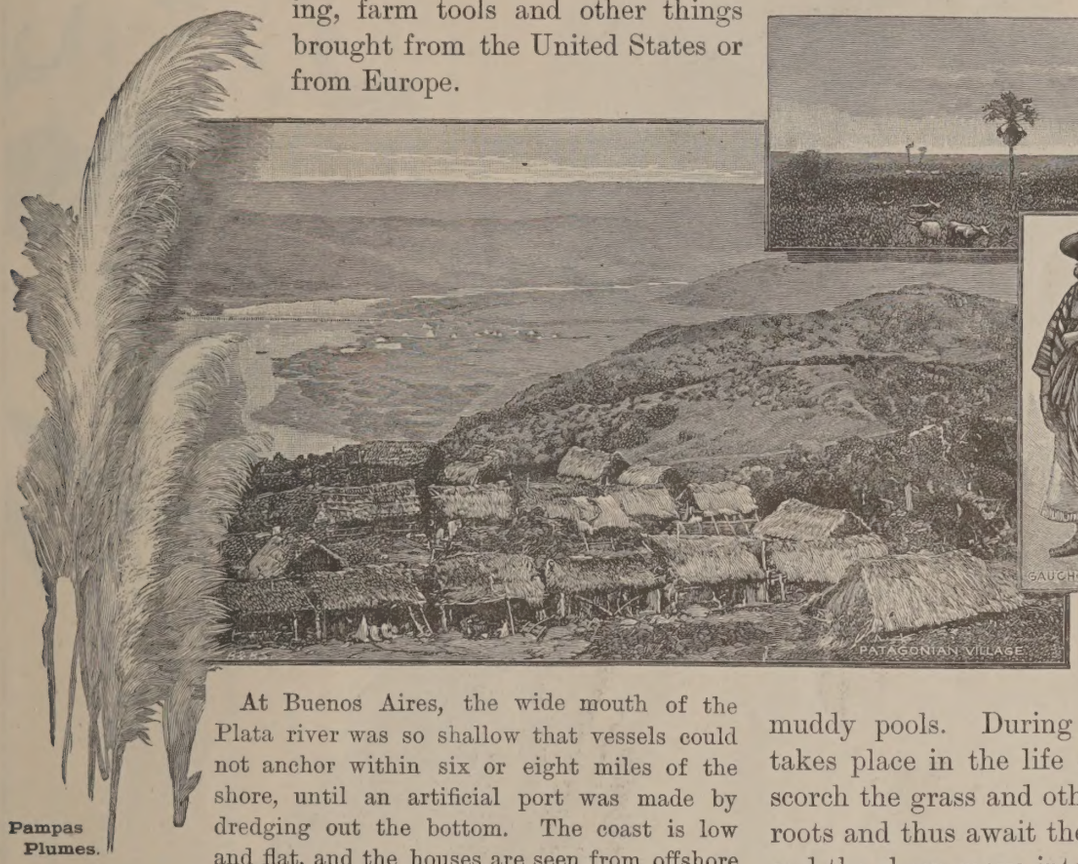
The streams of the chaco run into the Parana river. Many of the rivers which flow from the western highland towards the pampas dwindle away in the plain and do not reach the sea, because the rainfall is light and the water evaporates or sinks into the sandy soil.

The great gravel plains south of the pampas extend to the strait of Magellan and are known as the plains of Patagonia. These plains are not a single level stretch, but they consist of wide terraces, some of which are fully two hundred feet above the next lower on the east. These step-like plains rise from the coast towards the mountains.

The plains of Patagonia are in the belt of westerly winds, but receive only moderate rainfall, because the western slope of the lofty range takes most of the moisture.

This region is crossed by several shallow rivers, flowing from the Andes. The flood plains of the larger rivers are fertile, but many of the streams dwindle away for want of rain.

The white people who live in the Plata basin have great farms but few factories. These people send cattle and grain to Buenos Aires, the chief port of the country of Argentina. This city supplies the people with clothing, farm tools and other things brought from the United States or from Europe.



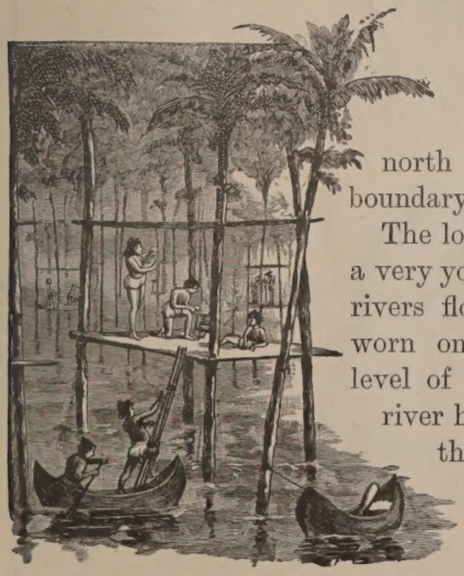
Pampas Plumes.

At Buenos Aires, the wide mouth of the Plata river was so shallow that vessels could not anchor within six or eight miles of the shore, until an artificial port was made by dredging out the bottom. The coast is low and flat, and the houses are seen from offshore before the land itself appears.

The city of Montevideo, on the northern shore of the Plata mouth east of Buenos Aires, has a good natural harbor and has therefore grown to be the chief port of the country of Uruguay.

64. The Llanos.

The third large river basin in South America is that of the Orinoco. On the south it adjoins the basin of the Amazon. On the west and north the Andes form the boundary.



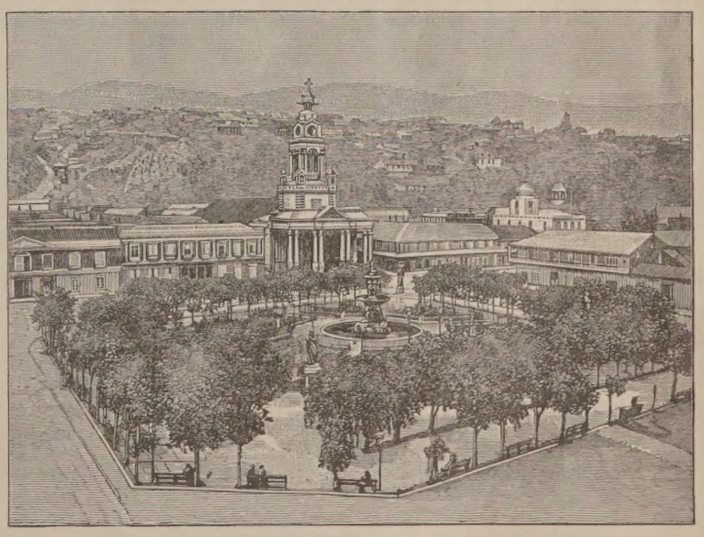
Tree Dwellers of the Orinoco.

The lowland of this basin is a very young coastal plain. Its rivers flow in narrow valleys worn only a little below the level of the plain. The main river has made a large delta that is low and swampy.

The plains of the Orinoco are called the *llanos*. When the sun is north of the equator, they are visited by the equatorial rain belt. The rivers are then swollen by heavy rains, and spread far and wide over their flood plains. Immense herds of cattle and droves of sheep feed on the rich grass which springs up all over the wet plains. The region then teems with life.

As the sun's rays become more and more slanting the

rains leave the llanos and move south towards the campos. The overflow in the lowland is slowly drained off. The rivers then grow smaller and shrink away from their banks. Turtles and snakes bury themselves in the mud. The smaller streams dry away, leaving only parched beds with here and there muddy pools. During the dry season a great change takes place in the life on the plains. Hot trade winds scorch the grass and other plants. They die down to the roots and thus await the return of the rains. The cattle and the sheep move into the flood plains or are driven to



A Square in Montevideo.

the grass lands among the border foothills. The plain becomes almost a desert.

In some places it is difficult to trace the divides between the three great river basins of South America. The Orinoco river and Rio Negro tributary of the Amazon are connected by the Cassiquiari river. Tributaries of the Amazon and Paraguay rivers, navigable by canoes, are separated by only three miles of plain.

With the exception of a few rapids and the portage of three miles, a person might journey in a canoe from the delta of the Orinoco to the broad mouth of the Plata.

RELIEF MAP OF ASIA.

65. Map Studies.[1]

Which is the larger, — North America or Asia? What strait separates these continents? Name the smallest ocean lying between them. What other oceans border on Asia?

What continents lie on the west and southwest of Asia? What name is given to Europe and Asia together?

What heat belts cross Asia? What have you learned about the season winds, or monsoons, over the Indian ocean? *See page 24.* Over what continent must the westerly winds blow before reaching central Asia?

Which is the coldest coast of Asia? In what direction does the main portion of the Asian highland extend? Which part of this highland looks the highest? Compare the Asian and Rocky mountain highlands as follows: Which looks the higher? — The wider? — The longer? *See globe maps.*

On which side of the Asian highland is the plain of Siberia? Name three rivers which cross this plain. In what direction is the central plain of North America longest? In what direction is the northern plain of Eurasia longest? Which of these vast plains is the larger? In which heat belts does the northern plain of Eurasia lie?

Into what sea does the Amur river flow? — The Yangtze river? *See colored map of Asia.* Name two streams that cross the plain of China.

What river runs eastward in the plain of India?

Draw the general shape of Asia, by using three or four straight lines. What is the trend of the Arctic coast? — Of the Pacific coast? — Of the Indian coast?

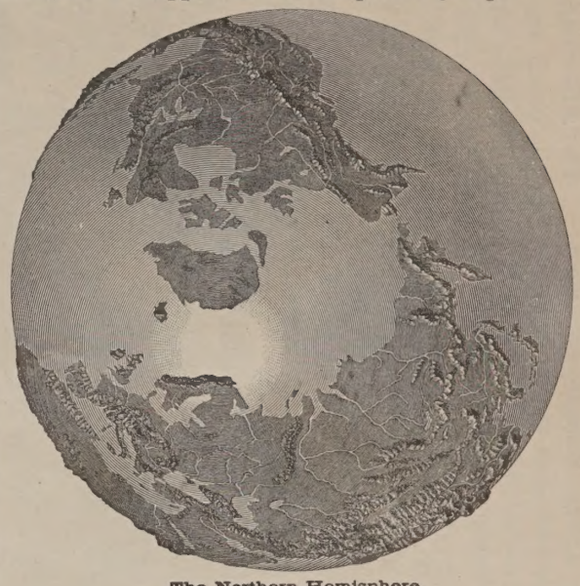
Sketch each of these coasts. Which is the most irregular? Which is bordered by the greatest number of islands?

What seas partly surround the peninsula of Kamchatka? — The peninsula of Korea? — The peninsula of the Dekkan? — The Arabian peninsula?

Locate the following islands: Borneo, Sumatra, Ceylon, the Philippine and the Japanese groups.

[1] See drawing and modeling *guide map* in *Supplement.*

Eurasia.



The Northern Hemisphere.

66. Asia.

Asia covers about one twelfth of the earth's surface, includes nearly one third of the total land surface, and is larger than all America. This continent may be roughly divided into three parts, — wide and lofty central highlands, with broad plains on the north and narrower plains on the east and south. The great Asian highland extends northeast and southwest.

The peninsulas on the south of Asia project far into the hot belt, while the Arctic coast lies wholly within the cold belt.

Part of central Asia is an interior basin at a long distance from the sea. This great basin is inclosed by lofty ranges and therefore has but little rain. The northern slope is in the path of the westerly winds but is far from the Atlantic ocean. The rainfall on that slope is therefore light. Summer monsoons yield heavy rains to the south and southeast slopes of Asia.

While the sun is north of the equator the broad surface of Asia becomes greatly heated. The heat is the more intense because of the dryness of the middle desert region.

As soon as the air over the land becomes hot and light, the cooler and heavier air over the oceans flows in and pushes the lighter air upwards. The moist sea-winds blow landward while the hot season lasts.

Summer winds moving inland from over the Arctic ocean yield but little rain to the northern slope, for they

are flowing towards warmer surfaces and can therefore hold more moisture than they bring. The heaviest rains are given to the south and southeast slopes of Asia, by the winds from over the Indian and Pacific oceans, because these damp winds are moving into cooler belts and up the high border ranges.

When the sun is south of the equator, the great central highland with its desert region becomes very cold. The cold air being heavy, then flows seaward and yields hardly any rain.

67. The Altai Highland.

From the rocky shore of Bering strait the world ridge turns to the southwest in Asia. For a long distance low ranges of mountains follow the Pacific coast.

A Tibetan and his Yak (Himalayas).

What range is near the northwest shore of the sea of Okhotsk? Where is the Yablonoi range?

The Yablonoi range runs into the Altai highland which extends inland towards the middle of the continent. The Altai plateau is about as high as the Great Basin in the United States.

The Altai highland is in the belt of the westerly winds, but their direction changes greatly with the seasons, because the air over this great continent is by turns very warm and very cold. The rainfall of this far-inland region is light. Most of the rain falls on the mountain ranges.

In what direction do most of the streams from this highland flow? What heat belt crosses it? What part of North America is in the same belt?

The Altai highland and a large part of the great plain on the north are forested with cone-bearing trees. In the broad valleys among the ranges, grain thrives and cattle find good grass land. Most of the towns in this region are built near the foot of the mountains, where the streams can be used to irrigate the land.

68. Central Basin Region.

The dry Basin region of central Asia is south and southeast of the Altai highland. The eastern part of this almost rainless basin is called the *desert of Gobi*. The western part is the *Middle Basin*.

What mountain range lies along the eastern border of the desert of Gobi? What high ranges inclose the Middle Basin on the north and the south?

The desert of Gobi is about as high as the Great Basin in our country, — 4000 feet. The Middle Basin is not quite so high.

The Basin regions of Asia and North America are alike in many respects. They are at about the same distance from the equator, — nearly half way to the north pole. Their surfaces are broken by low ranges, between which lie long troughs. None of their streams reach the sea, but all waste away or flow into salt lakes or marshes.

In both basins, the sides of the trough-like valleys are covered with coarse waste from the ranges, while the middle parts of the valleys receive the finer waste carried by the few streams. Strong winds that sweep over portions of the surface, lay bare the rocky ledges, and drift the sand into dunes. Most of the towns are built near the mountains where the streams flow out into the open valleys. These streams are fed mostly by rain or by snow melting on the high border ranges.

Less than half the region marked *Gobi* on the maps is really a barren waste. The desert runs east-and-west through the central portion, and even that is not so barren as the Middle Basin farther west.

In eastern Gobi, summer rains sometimes last for two or three days. Grass then springs up and provides food for the camels and horses in the caravans which carry tea from China to Siberia, whence it is taken to Russia. Over a large part of the so-called *desert of Gobi*, camels and sheep eke out a living on grass and bushes.

When it is noon in the Middle Basin, it is midnight in the Great Basin of North America. Can you tell why?

The western part of the Basin region of Asia is drier than the Great Basin of North America, for the former is much farther from the sea and is also inclosed by higher ranges on the windward sides.

The people in the western part of the Basin region of Asia lead a wretched life. Streams flowing at one time may be dry at another, and river valleys may thus become barren. The people are then forced to roam about in search of pastures for their cattle and sheep. The old towns are sometimes buried by drifting sand.

69. The Highland of Tibet.

South of the Basin region rises the great highland of Tibet. Large portions of its plateau[1] surface are nearly half a mile higher than lake Titicaca, and some of the peaks are twice as high above sea level as the plateau over which they rise. The highlands of Tibet and Bolivia are on almost opposite sides of the earth.

The rainfall of the inner part of the highland of Tibet is very light, owing to high ranges on its southern or windward border. Many of the valleys of Tibet are like those in the Great Basin of North America, but the former are much the higher. They are covered with waste from the inclosing ranges. Streams from the mountains run into the valleys, but there is not enough water to overflow and reach the sea. The lakes and marshes in these inclosed valleys are therefore salt.

Several of the lakes in the western part of the highland of Tibet are the highest in the world, being about 17,000 feet above sea level.

In some places, where the salt lakes or marshes dry away, the surface is covered with layers of white salt. Birds-of-passage often mistake these salty plains for bodies of water and descend to them.

The inner part of Tibet is almost a desert. Owing to its great height it is very cold, except during the days of a short summer season. The soil is poor and there are long periods of drouth. Large herds of wild yaks and musk deer search out grassy places near the streams and on the mountain sides. Few people live in the inner part of Tibet.

Three huge mountain ranges rise above the plateau of Tibet. These are the Kuenlun on the north, the Karakoram on the northwest, and the Himalaya on the south.

The word *Himalaya* means the *abode of snow*. Even in summer the snow line is about two miles below the highest summits.

Mt. Everest is thought to be the highest peak on the earth. It rises more than five miles and a half above sea level.

The Himalayas are so lofty that they form a barrier to about one half of the air and three fourths of the moisture moving towards them. There is very little moisture in the air above the peak of Mt. Everest.

The effect of such a barrier is very marked. Few of the kinds of plants which thrive south of the Himalayas are found north of the great chain. There is but little food to be found on the lofty slopes, and not many wild animals therefore can travel from one side of the chain to the other.

The Himalaya mountains separate two races of men, — the yellow people on the north and the white people on the south. Owing to the difficulty of crossing the range, these races have neither traded nor warred to any great extent with each other.

Just north of the Himalaya chain, the valleys in the plateau of Tibet are deep, because for a long time their rivers have had outlets to the sea and have carried away a great quantity of waste from the valleys. These valleys are drained by two large rivers, the Indus and the Brahmaputra, — the one flowing westward and the other eastward behind the range, and then escaping by deep gorges that they have cut through the mountains.

The upper parts of the Indus and Brahmaputra rivers are fed chiefly by snow melting on the lofty mountains. Along the sides of these streams are found most of the people who live in the highland of Tibet. They have small gardens and herds of yaks. To the natives of Tibet, the yaks are as useful as cattle are to us.[2]

Compared with the Appalachian mountains, the Himalayas are very young. Their slopes are steep and the waste is quickly washed away. Sometimes great landslides take place, — often blocking river valleys and thus forming lakes. When these suddenly break through the barriers, the water sweeps in a flood

[1] The average height of the plateau of Tibet is 14,000 or 15,000 feet.

[2] Lesson 114 tells some of the uses of yaks.

down the valleys, doing much damage to villages and farms. During the rainy summer seasons, mud avalanches pour down the slopes of many of these mountains. The rock waste has filled some valleys to the depth of from 500 to 1000 feet.

The southern slopes of the Himalayas face the moist monsoons from over the Indian ocean and have very heavy rainfall when the southwest trade winds of summer blow.

Khaibar Pass.

The Himalaya mountains are in several parallel ranges. The outer or southern ranges are the youngest. Owing to the heavy rainfall, many branches of the Ganges and Indus rivers are so strong that they have held their places and cut their valleys through the younger outer ranges which have been raised across their courses.

The work of these rivers shows how slowly the Himalaya mountains have been formed. While the ranges were being forced upward, the rivers were cutting their channels, and the mountains could not have been raised faster than the streams wore down the solid rock; for the depth of the gorges shows that the streams have held their places for ages. Many of these gorges are so narrow and steep-sided that they cannot be followed. The inner valleys of the highland are generally reached over lofty passes in the ranges.

On the east, the highland of Tibet sends long streams down the slopes of China. Several large rivers from the highland bend also to the southeast. These rivers flow in long valleys between lofty ranges which extend into the peninsulas of southeast Asia. The mountains are heavily forested.

Fig Tree and Figs.

One of the pictures on page 65 shows part of the vale of Kashmir, situated among the Himalayas not far from the place where the Indus river cuts across the chain. The level land of this vale was once the bed of a lake. The river which now meanders across the lake plain is a branch of the Indus. The part shown in the picture is about a mile above sea level, and the water must flow a thousand miles or more before it reaches the sea.

At the western end of the highland of Tibet stand the Pamir plateaus. We may think of this region as the mountain center of Asia. Almost all the loftiest ranges of the continent radiate from the Pamirs.

Eastward stretch the three huge ranges of Tibet. Towards the northeast run the Thian Shan mountains along the border of the Middle Basin. The Suliman range extends to the coast (*see map, p. 63*) and cuts off India from southwest Asia. The high Hindu Kush chain stretches westward along the northern border of the plateau of Iran.

70. Highlands of Southwest Asia.

The southwest portion of Asia is mostly a plateau region forming part of the great Asian highland.

Where is the plateau of Iran? What mountains are on the northeast? What range is on the east?

The plateau of Iran is about one third as high as the plateau of Tibet. The former is almost inclosed by mountains and is too far west to receive the rainy summer monsoon which blows from the southwest towards the Himalayas.

The plateau of Iran resembles the Great Basin of North America. Both have small streams, salt lakes and salt swamps. In both, the valley troughs are covered with waste from the ranges; in places, sand drifts into dunes; the people settle chiefly near the ranges, where the mountain streams can easily be used to irrigate the land; canals and ditches lead the water over the cultivated districts. As a whole, both regions are dry and unproductive.

In the Suliman range are two important passes over which caravans have gone for centuries. The Khaibar pass is one of the chief gateways between the high region of Iran and the low fertile plains south of the Himalaya mountains. This pass is only about half a mile above sea level. *See map on page 63.*

Another low place in the crest of the Suliman range is the famous Bolan pass, southwest of the Khaibar. This pass has been the scene of many fierce conflicts between caravan guards and the natives of the mountain region. In recent years the native tribes have been subdued.

Persia occupies the greater part of the plateau of Iran and extends from the Caspian sea to the Arabian sea.

On the plateau of Iran is a region known as the *Persian salt desert.* This covers a large area and consists of solid salt several feet thick in most places. In some parts it is of unknown depth. Centuries must have passed while the water which has now evaporated was depositing this great bed of salt.

What gulf is on the southwest of Persia? What country is west of Persia? *See colored map of Asia.*

Southwest of the plateau of Iran lies a small river valley sloping to the Persian gulf. The greater part of this valley consists of the flood plains of two rivers, — the Tigris and the Euphrates. Canals have been made to lead water over the plains, and some parts of them are very productive. Wheat is the leading crop. Figs and dates also thrive here.

For many centuries this valley has been peopled by the white race. Under strong rulers, the people thrived and made fine systems of canals to irrigate the land. Then the crops were large, great cities were built, and the nation became prosperous.

For a long time the rulers have been weak. The land has been overrun by thieving tribes that have not only robbed the tillers of the soil, but have also destroyed many of their canals. Fearing these robbers and also having heavy taxes to pay to their cruel rulers, the people have allowed the remaining canals to go to ruin. Many parts of the valley that were once fertile have become sandy and barren.

The Persian gulf is the shallowest of five arms of the sea that almost surround the portion of Asia extending westward from the plateau of Iran. Name the other four seas.

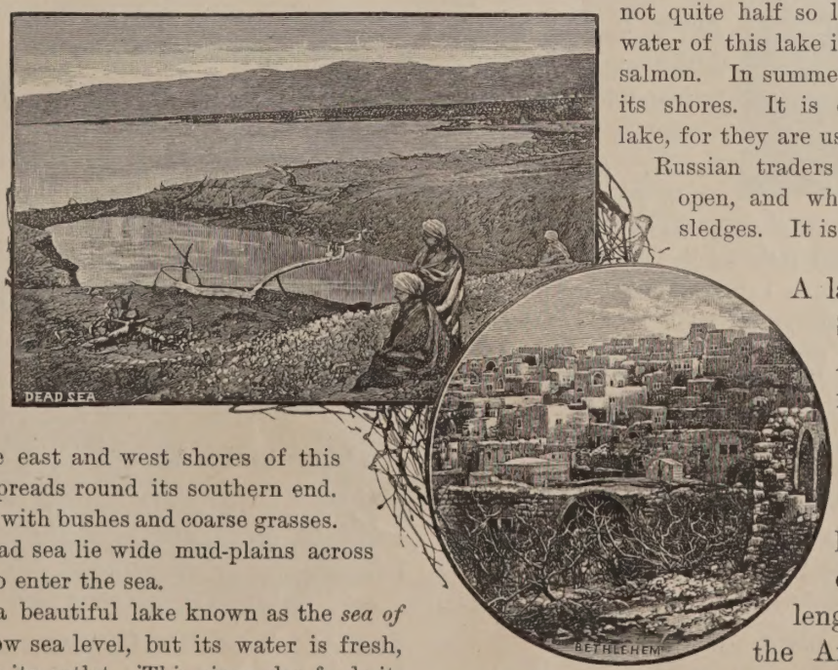
Cedar of Lebanon.

A low plateau spreads out towards these seas. Its average height is about one half that of the Great Basin in our country. A large portion of the region is desert, but there are also many grassy slopes and fruit groves. The land is poorly tilled.

Between what seas does the Caucasus mountain range extend?

There are many old lake basins in the region south of the Black sea. These contain small lakes, most of which have no outlets, for there is not now enough rainfall to supply more water than evaporates. Several small rivers flow down the north slope of the plateau. Mt. Ararat, in this plateau region, is a famous volcanic cone a little more than three miles and a fourth high.

Many small but fertile slopes descend from western Asia to the Mediterranean coast. They receive light rainfall from the westerly winds. Figs, olives and grapes in large quantities are raised in that district.



The *Dead sea* is in one of the most famous valleys on the earth. The water of this sea is about ten times as salt as that in the ocean and is also very bitter. The sea is not quite fifty miles long. Its surface is about one fourth of a mile below the level of the ocean.

Steep slopes descend to the east and west shores of this inland sea, but a wide marsh spreads round its southern end. The wet land is thickly covered with bushes and coarse grasses. At the northern end of the Dead sea lie wide mud-plains across which the river Jordan flows to enter the sea.

North of the Dead sea is a beautiful lake known as the *sea of Galilee*. This lake also is below sea level, but its water is fresh, because the river Jordan forms its outlet. This river also feeds it.

The Jordan and the two lakes are in one long valley. It is shut in by high land on both sides. One low range near the southwest shore of the Dead sea contains a deposit of rock salt about six miles in length.

The slopes of the Dead sea valley are mostly barren. Rain seldom falls in this region, except on the mountains. All summer the hot sunshine pours down upon bare and rocky slopes.

The peninsula of Arabia is mostly a desert plateau. In many respects it resembles the Great Basin but is much drier. Dates and wheat are raised in some of the narrow valleys near mountain ranges. Camels and horses also graze there.

Some of these valleys not far from the sea are thickly settled. Until recent years the chiefs have kept travelers out of this part of the country. Many of the chiefs have great wealth and fine buildings.

The hilly slopes near the southern end of the Red sea are famous for their coffee crops.

71. The Arctic and Caspian Slopes.

The northern part of Eurasia consists mainly of a broad low coastal plain. The Ural mountains run north and south across the plain and form a portion of the boundary between Asia and Europe. The Arctic lowland in Asia is known as the *plain of Siberia*. Nearly all of this plain is in the basins of three large river systems.

Name three rivers flowing across the plain of Siberia. Where do they rise? Which of these rivers, through one of its branches, receives the overflow of lake Baikal?

This lake is about one fourth of a mile above sea level and is almost encircled by forested mountain slopes.

Lake Baikal is the largest body of fresh water in Asia, but it is not quite half so large as lake Superior. The water of this lake is very deep, and it abounds in salmon. In summer many seals are caught along its shores. It is curious to find seals in this lake, for they are usually seen only in the oceans. Russian traders navigate the lake while it is open, and when it freezes they cross it on sledges. It is a useful highway of trade.

A large part of the plain of Siberia lies within the Arctic circle. For two months or more in winter, the greater portion of the Arctic coast of this plain is in darkness. The longest period of summer daylight lasts for an equal length of time. South of the Arctic circle, in all parts of the Siberian lowland, the summer days are long and the winter days are short.

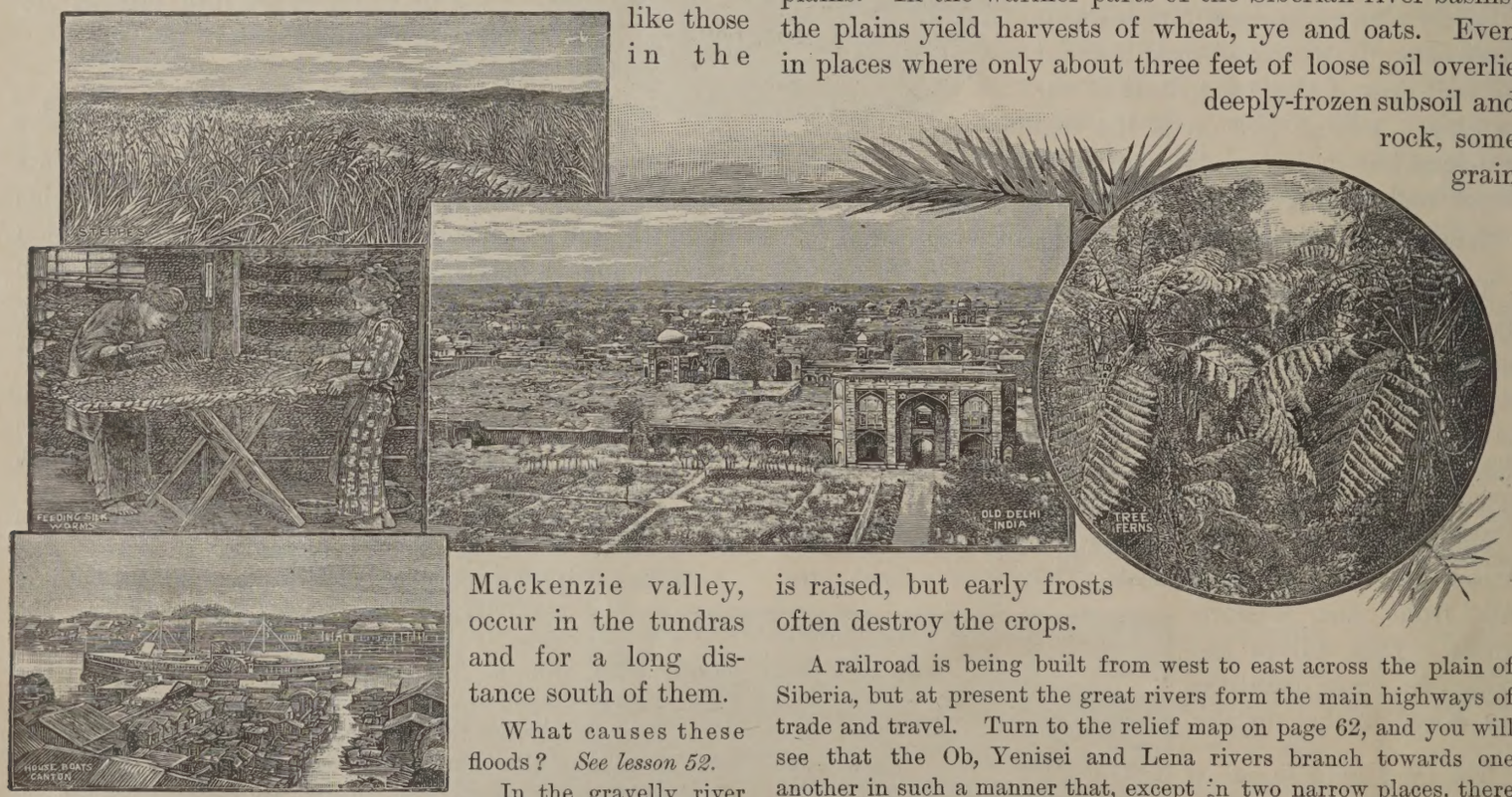
Being far from the equator and far inland from the warmer oceans, the plain of Siberia has long and very cold

winters. The summers are short. They are cool in the northern part of the plain, but warm in the southern part.

The map of the heat belts, page 21, shows how far south the cold belt extends in Siberia. There, in the lower part of the Lena basin, is the coldest winter region known in the world. The ground is frozen to the depth of several hundred feet, and even in summer the soil thaws for only a few feet below the surface. The extreme cold is due to the fact that the region is far inland from the warmer oceans, that the winter nights are long, and that warm winds from the far south cannot cross the great central highland.

The average temperature in the coldest part of Siberia is only a few degrees above zero. The winter average is more than 50° below zero; and 90° below have been recorded.[1]

Along the Arctic coast of Siberia are mossy marshy plains called *tundras*. They resemble the marshy plains along the Arctic coast of North America. Heavy floods, like those in the Mackenzie valley, occur in the tundras and for a long distance south of them.



What causes these floods? *See lesson 52.*

In the gravelly river banks of the Siberian tundras, fossil elephants are found. These had woolly coverings that fitted them to live in the cold plains. The "woolly elephants" are unlike any now found on the earth; yet the flesh of these great beasts, after being buried perhaps for many centuries in the frozen ground, is sometimes found well-preserved and is eaten by dogs.

The tusks of these fossil woolly elephants have for a long time supplied part of the ivory so finely carved in China and Japan.

In summer large herds of reindeer visit the tundras to feed on reindeer moss. As the cold season advances, the deer go southward to places where they can find food and daylight. White bears and seals are seen along the Arctic shore, but both the plant and the animal life are scanty. The region is dreary and desolate, except for a few weeks in summer.

[1] At the trading station of Verkoyansk, 350 feet above sea level. *See map of Asia in the Supplement.*

South of the tundras, as in North America, lie the forest plains. Most of the trees are cone-bearers, — larch, fir and pine. The forest belt crosses northern Eurasia, from the Pacific ocean to the Atlantic. In Asia the forests extend southward to the border of the desert of Gobi, the Middle Basin and the dry plains around the Caspian sea.

In the Ob basin, east of the Ural mountains, the growth of trees is very dense. There the forested swamps cover many thousand square miles.

Like the rest of the forest belt, the Ob swamps abound in fur-bearing animals. Among these are squirrels, sables, bears and reindeer. Hunters in the Ob swamps must use great care, for large areas consist merely of thickly-woven roots and grasses floating on water. A false step may cost a life.

The forest belt is broken in many places by wide open plains. In the warmer parts of the Siberian river basins, the plains yield harvests of wheat, rye and oats. Even in places where only about three feet of loose soil overlie deeply-frozen subsoil and rock, some grain is raised, but early frosts often destroy the crops.

A railroad is being built from west to east across the plain of Siberia, but at present the great rivers form the main highways of trade and travel. Turn to the relief map on page 62, and you will see that the Ob, Yenisei and Lena rivers branch towards one another in such a manner that, except in two narrow places, there is a water way from the Ural mountains to the Stanovoi range.

In summer many steamers navigate the rivers, and in winter the smoothly-frozen surfaces of the streams make excellent roads. The winter travel is mainly on sledges drawn by deer.

The natives of the Siberian plain belong to the yellow race. Many white people from the great plain in Europe have settled in Siberia, and these now greatly outnumber the natives.

Along the southern border of the forest belt, the open plains, or *steppes*, are covered with fine fertile soil. Large crops of grain are raised, and many cattle, sheep and horses graze on the plains.

The southwest part of the northern plain of Asia is drained towards the Caspian and Aral seas. As the region is low and far inland, it has only light rainfall and is therefore almost treeless. The rain comes in summer when the sea-winds blow over the heated plains. In winter the heavy air tends to flow outward from this region.

The grass in any one part of this region is not plentiful enough to support the cattle and sheep. The people therefore wander with their herds from place to place, living in tents and carrying all their possessions with them. Such wandering people are called *nomads.*

East of the Caspian sea, the plain is desert-like and barren, except where streams from the mountains are led aside in canals to irrigate the land.

The surface of the Caspian sea is lower than the level of the ocean, but the surface of the Aral sea is higher. Both these seas are salt.

The Caspian sea is more than four times as large as lake Superior. The southern end of this sea, near the mountainous coast, is very deep.

Thousands of people earn their living by catching fish in this great salt lake or in the rivers which flow into it. Many steamers and sailing vessels are engaged in carrying freight between the Caspian ports.

The Caspian and Aral seas were once much wider than at present, — probably at the time when a great lake stood in our Basin region. The Aral sea then had an outlet leading to the Caspian. As the climate became drier and the seas shrunk away, the margins of their shallow bottoms formed salty plains. These plains now spread in a wide belt around the seas but yield only coarse grasses.

72. The Pacific Slope.

From Bering strait to the Amur basin, the east slope of Asia is very narrow and therefore has no large streams.

The Amur river is the natural highway from the Altai plateau to the Pacific coast. The basin of this stream is so far from the equator that the winters are long and severe. The region is thinly settled and is largely overgrown with forests.

Name two rivers that flow across the plain of China. Where do these rivers rise? What mountain range divides the middle parts of their basins? Where is the Nanling range?

Which heat belt crosses the basin of the Hoangho or Yellow river? In which belt is the greater part of the Yangtze river basin?

Chinese Tea House.

The southeast slopes of Asia, including the basins of the Yellow and Yangtze rivers, are watered partly by rains from the summer monsoon and partly from winter storms. The summer rains are much the more abundant.

The great delta plain of China is made of soil carried down by the Yellow and Yangtze rivers, — mostly by the former. This delta plain contains many thousand square miles and is one of the most thickly settled regions in the world.

Above the delta plain, the Yellow river flows through a district covered with deep yellowish soil. This was brought as dust by the winds from the dry inland Basin region. The area covered by this soil is far greater than that of the lava plains of the Columbia plateau region.

Loess Beds, Yellow River Basin, China.

In some places the yellowish soil, called *loess,* is hundreds of feet in depth. It fills valleys, buries hills and rises far up the slopes of mountain ranges. Rivers have cut deep valleys in it, and in the sides of the valleys, at points which the streams no longer reach, millions of Chinese people have dug caves for homes. This soil is very fertile, and gardens cover a large part of the region.

The Yellow river has carried down countless tons of the yellowish soil and has made of it the larger part of the great delta plain of China. Each year the plain grows farther into the sea, for no ocean current strong enough to carry away the silt sweeps past the mouth of the river. Cities in China that were once seaports are now far inland.

The delta plain of the Yellow river, like every other delta plain, slopes gently away on both sides from the muddy river which brings down the soil. Banks have been built along the river to keep it in its proper channel. Several times the water has burst through the banks and rushed in floods over the plain. Cities and towns have been swept away, and many thousand people have been drowned. The Chinese call the river *China's sorrow,* on account of the destruction and suffering it has caused.

Each overflow of the Yellow river has given it a new course across the fertile plain and a new mouth about which to deposit sediment and thus build its delta forward. In the course of centuries, the river has shifted its mouth three hundred miles back and forth along the coast.

The Yellow river takes its name from the yellowish soil which discolors the water. This river performs its chief work in making delta lands, for it is of little use to steamers entering from the sea. The current in some places is very swift, and numerous bars form, not only at the mouth of the river, but also far upstream.

As the river has changed its course, and as it is hardly navigable, only a few large cities have grown up along its banks.

The Yangtze river has built the southern part of the great delta plain of China. This stream forms the best water way on the eastern slope of Asia, and is open to large steamers for more than a thousand miles from the ocean. Many of the greatest cities in China have grown up on the banks of the Yangtze river.

Above the delta plain, for a long distance inland, the basins of the Yellow and Yangtze rivers are rolling or

hilly. The western portions of the great basins are in the mountainous regions of Tibet.

The leading exports from China are tea and silk. Rice and a grain called *millet* are among the chief food products.

The tea plant is hardy, but it grows best in a hot, moist and even climate. It needs a great deal of rain, yet the plant dies if placed in swampy land.

Several times a year, crops of leaves are picked for curing. Care is taken to nip off the leaves without injuring the buds which grow where the leaves join the branches. The youngest and earliest leaves are the most delicate and give the best-flavored tea.

A Chinese Junk.

The green leaves which are to be cured and sold as black tea are first spread on trays to dry. The leaves are then roasted for a few minutes and afterwards rolled between the hands to press out the juices. As the leaves dry, they turn black and are then ready for use.

The green and the black teas are made from the same kind of leaves, but for green tea the process of drying is completed as rapidly as possible after picking. About four pounds of fresh leaves are needed for each pound of tea.

Silk is made of fibers spun by silkworms. These little creatures feed on the leaves of mulberry trees.

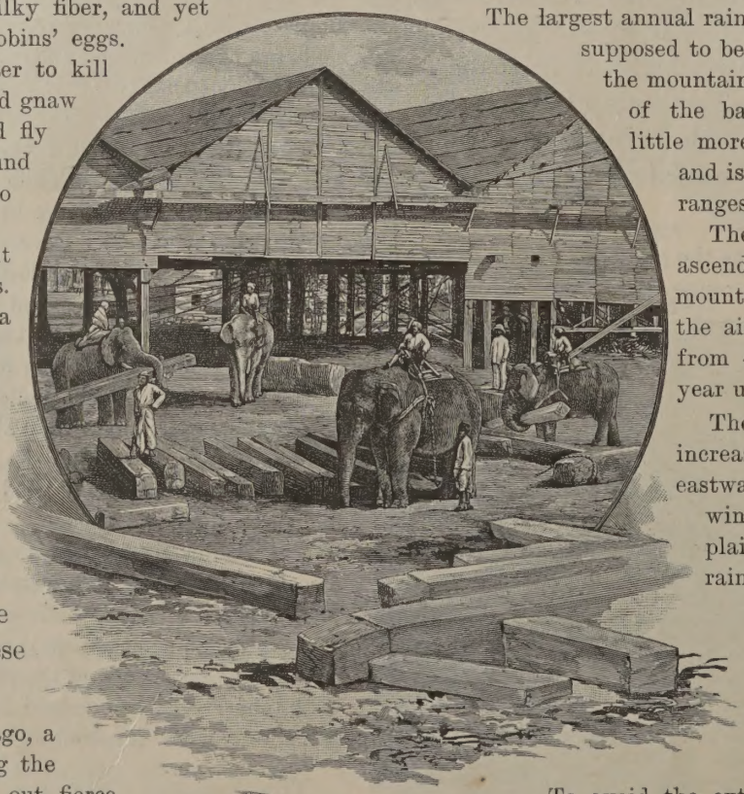
Each worm makes a silken case, or *cocoon*, by spinning fine long threads and winding them around its body. Some of the cocoons contain more than two miles of silky fiber, and yet they are only about as large as robins' eggs.

The cocoons are put into hot water to kill the silkworms; otherwise they would gnaw their way out, spoil the cocoons and fly away as moths. The fiber is unwound from the cocoons and is made into thread or cloth.

Southeast Asia and the adjacent islands are famous for their fine silks.

Hongkong and Shanghai have a large trade in tea and silks.

Canals extend almost the whole width of the great delta plain of China and form fine water ways. They supply water also for large tracts of land on which rice and other products are raised. A large inland trade is carried on by way of these canals and rivers.



Trained Elephants, India.

More than two thousand years ago, a high and wide wall was built along the former boundary of China, to shut out fierce Tartar tribes on the north. The wall runs for more than a thousand miles over mountains and through wide valleys. Many parts of the great wall are now crumbling to ruins.

China contains about one fourth of the people in the world. The Chinese belong to the yellow race.

From the Tibetan highland mountain ranges extend into the great peninsula of southeast Asia. Swift streams flow in the valleys between these ranges. The longest of the streams is the Mekong river.

The course of the Mekong is in many places broken by rapids. The river is therefore not open to navigation, except for about three hundred miles from its mouth. The Mekong is building a delta plain, but it is not nearly so large as the delta plain of the Yellow river.

73. India.

The great country of India is bordered on the north by the Himalayas. In the south it contains the plateau of the Dekkan in the large V-shaped peninsula. Between the Himalayas and the Dekkan are broad river plains.

India is in the path of the monsoons. In the hot season these winds blow from the sea to the land; in the colder season they blow from the land to the sea.

In the Indian ocean north of the equator, not only the winds but the currents also flow back and forth as the seasons change. Soon after the wind alters its direction, it turns back the ocean current, and both flow together till the monsoon again shifts with the season.

The Himalaya mountains form the greatest rain and snow producer in the path of the summer monsoons from over the Indian ocean. Both the northern and the southern slopes of this range are drained by rivers that flow into the low plains of India.

The largest annual rainfall in any part of the world is supposed to be at the town of Cherrapunji, in the mountains about two hundred miles north of the bay of Bengal. This town is a little more than 4000 feet above sea level and is walled in on the north by steep ranges rising 2000 feet higher.

The moist monsoon from the sea ascends more than a mile before it surmounts the ranges. In rising over them, the air expands, cools and gives down from 400 to 600 inches of rain each year upon the town.

The snows of the Himalayas are increased by winter storms which drift eastward, like those of the westerly winds elsewhere. The northern plains of India often receive light rains in the same season. This fact seems to show that in winter, the belt of westerly winds reaches far enough south to influence the climate of northern India, both in the mountains and in the plains.

To avoid the extreme heat of the plains, many Europeans living in northern India spend the hot season on the "hills," or low ranges along the southern border of the Himalayas.

Below the snow line, forests cover the southern slopes of the Himalayas. Near the foot of the range, trees, vines, bushes and grasses form dense jungles in which tigers, elephants, rhinoceroses and other huge beasts are found. One of the pictures on page 68 shows some of the tree ferns of that region. *See pictures, p. 117.*

Above the wet jungles is a belt of hard-wood trees, — oak and walnut. Still higher, the mountain slope is covered with rhododendron shrubs with their acres and acres of large showy blossoms.[1] Between these and the snow line stands the belt of soft-wood or cone-bearing trees.

Most of the rivers of the plain of India are included in three systems, — the Indus on the west, the Brahmaputra on the east, and the Ganges in the middle part.

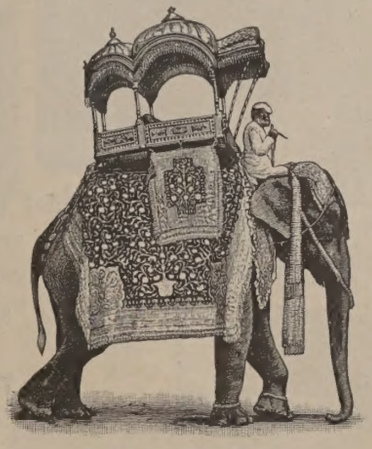
These three river basins are in the warm belt and also in the path of the moist southwest monsoons. The climate is therefore hot or warm most of the year. The heavy rains fall while the summer monsoon lasts. The dry season occurs when the winds blow from the land to the sea. *See maps on page 24.*

A Hindu.

All along the foot of the Himalayas, as of other high ranges, cool evening breezes flow from the mountain valleys and enter the warmer lowland. These winds last far into the night and greatly lessen the sultry heat.

The upper portion of the Indus lowland, near the foot of the Himalayas, is well watered and is the richest wheat region in India. The lower part of this river basin is a desert.

Large sand bars form shoals in the bed of the Indus river. Navigation is therefore difficult, but steamers succeed in going up the river as far as the wheat country.



State Elephant, India.

The plain of northern India, like that of the valley of California, is formed of land waste brought by the rivers from the mountains. Many branches of the Ganges river rise in the southern slope of the Himalayas. So much waste in the form of alluvial fans (*see page 8*) has been washed from the slopes of this range, that the Ganges river has been pushed far southward towards the Dekkan. Near the mountains the coarse waste forms steep slopes, but far out in the valley the fine waste forms very gentle slopes.

A Zebu Cart, Ceylon.

On the lowland, the divide between the Indus and Ganges basins is formed where the plain built by the rivers is a little higher than on either side, east or west.

[1] The flowering shrubs in the picture of Mt. Mitchell, on page 42, are rhododendrons. They often cover thousands of acres.

Near the base of the mountains, the gravels are moist with ground water and are covered with forests; but the greater part of the plain has no forests, and over much of the surface there are few trees, except in irrigated gardens.

The Ganges system has built very large flood plains, sloping only a few inches to the mile. In the rainy season, these plains are flooded far and wide, thus receiving fresh soil from the highland slopes. The Ganges and Brahmaputra rivers unite in making a large delta plain crossed by a great network of distributaries.

The plains of the Ganges basin are carefully irrigated by means of canals and ditches leading from the rivers. The rainfall of the summer season is thus made to serve for the entire year, often through long periods of drouth.

Before India became a British possession, suffering from famines was common whenever the rains came late or in small quantity. There is not so much suffering now, because the English people have improved the canals and have also built railroads which can quickly carry supplies to famine-stricken provinces.

Rice is the leading crop in the delta lands and in the lower parts of the flood plains. Farther inland, *millet* is the chief product and is the staple food in nearly all parts of India. Cotton is the most valuable article of export from the Ganges plain.

The Ganges river is navigable for more than a thousand miles through its great flood plains, and is alive with boats carrying products from place to place.

In summer, violent thunderstorms occur in the Ganges plain. Squalls precede these storms and fill the air with dust. Then follow the clouds with lightning and rain, and all go sweeping down the plain.

Destructive cyclones, or violent whirling storms, are common in the great delta plain of the Ganges and Brahmaputra rivers. The winds sometimes drive the sea-water onto the low delta lands, forming storm floods in which thousands of people are drowned.

The Brahmaputra river, like the Indus, flows in a deep inland valley on the north flank of the Himalaya range. Cutting through the eastern part of the range, the Brahmaputra crosses the low plain of northeast India and joins its delta with that of the Ganges river. This great double delta is slowly growing southward into the bay of Bengal.

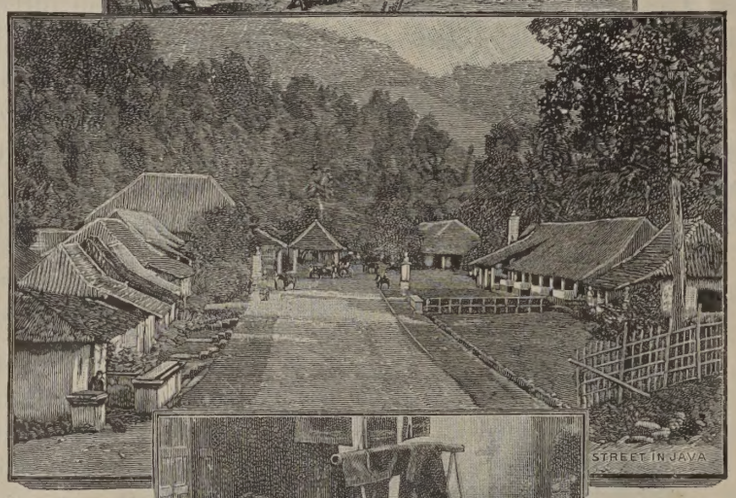
Cart drawn by Zebus, India.

The *teak* tree abounds in India and in the large peninsula of Indo-China still farther east. When the wood of the teak has been thoroughly dried, it will not shrink, warp nor crack, even under the tropical sun. This wood is very strong, is easily carved, and takes a fine polish. These qualities make it very valuable.

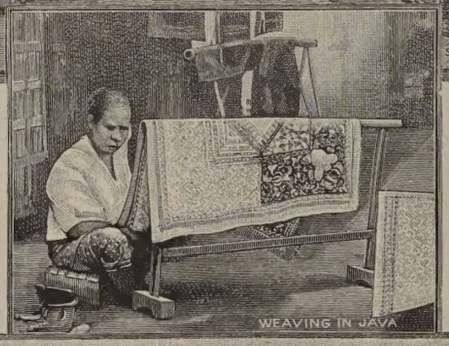
The lowlands of northern India, except the desert region of the lower Indus, are densely peopled. These lowlands, together with the V-shaped peninsula on the south, support about one fifth of the people in the world. Most of the natives are called *Hindus*. They belong to the white race.

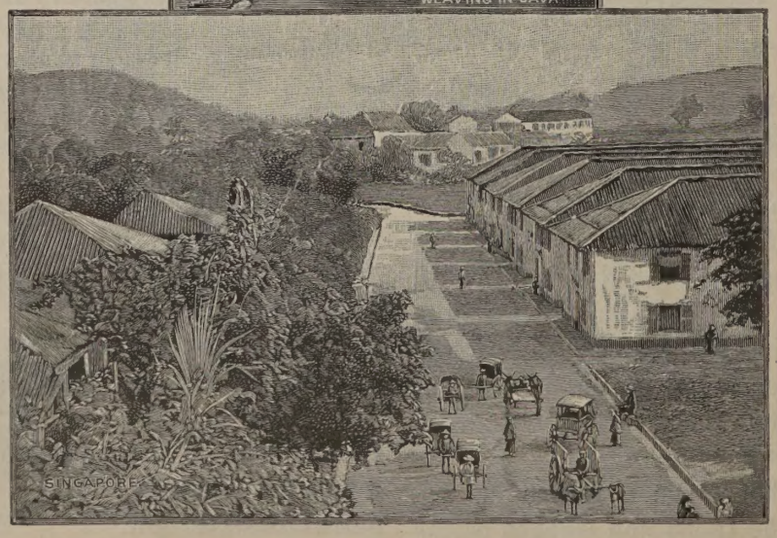
DYAKS OF BORNEO

Ages ago the people now known as Hindus moved into India, probably from some part of central Asia, and conquered the native tribes. Many of the descendants of these natives are now found in the hilly or mountainous regions of India. Highlands are often a place of refuge for man, as well as for the lower animals.


STREET IN JAVA

Southward from the Ganges basin extends the great V-shaped peninsula of the *Dekkan*. This is mostly a low plateau region, about equal in height to the Appalachian highland. The peninsula has low ranges facing the sea on both sides and is partly separated from the rest of India by a hilly range on the north. Within the triangle thus formed, about 100,000,000 people have made their homes, — many more than dwell in our entire country.


WEAVING IN JAVA


SINGAPORE

The Dekkan is highest on the west side, and its main streams therefore flow eastward into the bay of Bengal. The Western Ghats rise abruptly from a narrow coastal plain. The steep western slope is in the path of the southwest monsoon, and therefore receives very heavy summer rainfall. The rains of the inland plateau east of the Western Ghats are not so heavy. Can you tell why?

During the wet season the rain water is stored in large hollows or reservoirs; then when the dry seasons come, the water is led in ditches over the lower tilled land.

The lava-flows of the Dekkan peninsula have been fully as great as those in and around the Columbia plateau. In each case the molten rock covered many thousand square miles. The Dekkan lava-flows are much the older and the more deeply cut by valleys. The surface is finely weathered, making dark soil that is very fertile. The middle picture on page 14 shows part of this plateau.

The portion of the Dekkan that is not buried in lava is mostly an old mountain region greatly worn down. Gold is found in the stumps of the old mountains.

The rivers which flow eastward across this peninsula have made flood plains and deltas of wonderful fertility. For ages these lowlands have yielded immense crops of rice. All over the peninsula, except on the rugged mountain slopes, cotton and grain are raised. There, as in northern India, millet is the chief article of food among the masses of poor people. Cocoanuts are a leading product. *See picture on page 97.*

The island of Ceylon, off the southern coast of India, is very fertile and yields about the same kinds of products as the adjacent mainland. Large quantities of cinnamon, tea, coffee and cinchona are exported from this island.

Railroads lead from nearly all parts of India to the port of Bombay on the west coast, to Calcutta in the Ganges delta, and to Madras on the southeast coast. These are the chief ports through which the cotton, rice and other products are sent to foreign countries, and through which clothing and tools are received in return.

74. Asiatic Islands.

Long curving chains of islands lie east and southeast of Asia and partly inclose large border seas. These islands contain hundreds of volcanoes, many of which are now active.

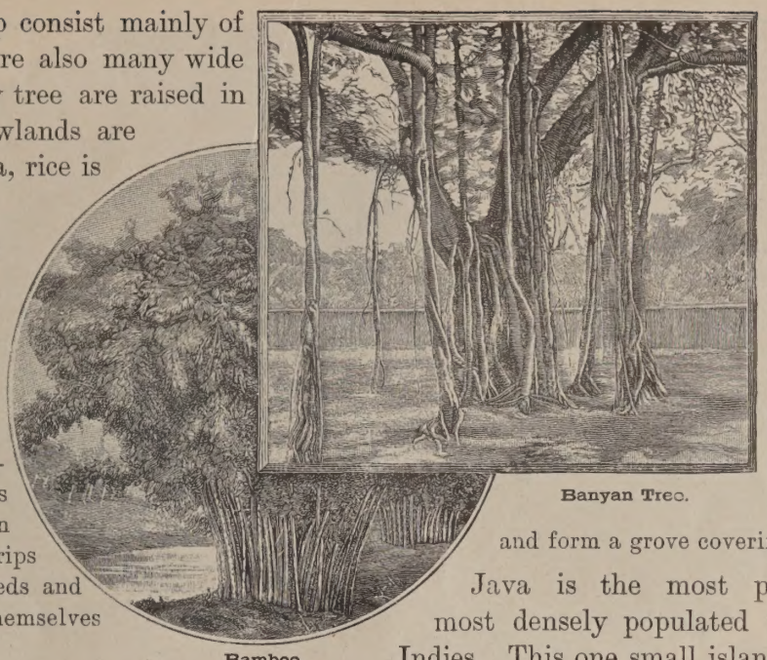
Fujiyama, in Japan, is the most noted of these volcanoes. Its cone rises about two miles and a half above sea level, and its crater is very deep. Fujiyama is not now active, but nearly two hundred years ago it burst forth and sent a heavy shower of ashes far and wide over the country. Its great cone was cracked and split. Many thousand people in the surrounding country were killed during the eruption.

To the people of Japan, Fujiyama is a sacred mountain, and many pilgrims ascend it each summer.

The large islands in the Japan group consist mainly of old volcanic hilly country, but there are also many wide plains. Tea, grain and the mulberry tree are raised in the uplands, while nearly all the lowlands are used for rice fields. Here, as in China, rice is a very valuable food product.

A coarse grass-like plant called *bamboo* grows in Japan, as well as in most parts of southeast Asia and the border islands. Bamboo is also found in other warm lands. The hollow jointed stems grow to the height of forty or fifty feet, but some stems are more than seventy feet high.

Houses are in part made of strips of bamboo stems. The tender shoots are served as food. The softer parts of the stalks are beaten into pulp and are used in making paper. Strips of bamboo are made into baskets, chairs, beds and various other articles, though the Japanese themselves do not use chairs or beds.



Banyan Tree.

Bamboo.

The rivers of Japan, though short, are useful for floating logs of cedar and pine from the hilly districts to the sawmills near the coast. Large flat-bottomed boats on these streams carry produce down to the ports.

Fujiyama, Japan.

The people of Japan belong to the yellow race. Their number is more than half as great as that of our own nation. Yokohama is the chief port through which foreign nations trade with the Japanese. Silk, tea and rice are important exports.

Java, Sumatra, Borneo, Celebes, the Philippine and many other islands southeast of Asia are often called the *East Indies*.

Thousands of years ago these islands were probably connected with Asia. The seas around them are mostly shallow, and the broken coastlines formed by the drowning of valleys show that the land has settled. Moreover many of the same kinds of large animals are found both on the mainland and on the large border islands, but not beyond the deeper water which separates these islands from those nearer Australia.

Locate Java on the *key map*, page 97. In what direction is it from Borneo? From Sumatra? From Australia? From the mainland of Asia? What rain belt crosses Java, Borneo and Sumatra?

The groups of islands in the East Indies have a hot climate and abundant rainfall. Their soil is therefore very productive. Sugar, coffee, tea, spices and rice in large quantities are raised on these islands, but chiefly in Java.

The *banyan* tree is found in some parts of the East Indies and on the mainland of southeast Asia. The branches of this tree send down shoots that take root in the ground. These shoots also branch and the new branches send down other shoots. A single tree may thus spread and form a grove covering several acres.

Java is the most productive and the most densely populated island of the East Indies. This one small island supports a population equal to one third that of the United States.

Most of the people in the East Indies belong to the brown race. Many white people from Europe have settled along the coasts of the islands, especially in the seaports. Nearly all the islands are claimed by nations in Europe.

Mikado's Palace, Japan.

Sumatra consists mainly of a mountain region along its southwest coast, and broad lowlands stretching from this highland to the northeast coast. The rivers which cross this lowland are building great deltas. Coffee and sugar are valuable exports.

Borneo is one of the largest islands in the world. Its area is equal to nearly one tenth that of the United States, exclusive of Alaska. This great island has a central plateau from which several ranges branch into the coastal lowland.

Among the Malay people of Borneo are many tribes of Dyaks. These are thought to be descendants of the earliest natives. The Dyaks build houses or huts of bamboo, as shown in the picture on the opposite page. These natives weave cloth and make iron tools. Among the large animals of Borneo are the wild ox and the orang-outan, a man-like ape. There are also many wild pigs.

The Philippine group consists of more than 1000 islands. In the more rugged portions of these islands are found thousands of dwarf people called *Negritos*. The more fertile lands are held by Malays. There are also many Chinese and some white settlers, — the latter being mostly Americans and Spaniards. The islands once belonged to Spain, though now under the control of the United States.

Large quantities of sugar, hemp and tobacco are raised on these islands and are the most valuable exports from Manila, the chief seaport. *See Supplement.*

RELIEF MAP OF EUROPE.

75. Map Studies.

Which is the larger, — North America or Europe? What oceans lie between these continents?

What seas and mountains bound Europe on the south? What mountains, river and sea separate the northern plain of Eurasia into two parts, — one in Asia and the other in Europe? Which of these parts is the larger?

Which heat belts cross Europe? In which of these belts is the broad middle part of the continent? What portion of Europe is in the warm belt? In which belt of winds does Europe lie?

Where are the Alps? In what general direction does the highland of southwestern Europe

extend? Compare it with the Rocky Mountain highland, — in trend, — in length, — in breadth. *See globe maps.*

Name two rivers flowing into the Caspian sea. Where are the Valdai hills? Describe the course of the Volga river; — of the Dwina river; — of the Danube river. Which one of these rivers flows in the coldest region?

Draw the general shape of Europe, — using three or four straight lines.[1] Sketch each coast. Which has the more regular coastline, — North America or Europe?

Name five large bodies of water that partly surround the Scandinavian peninsula. *See colored map of Europe.*

What sea is east of England and Scotland?

[1] See *guide map* of Europe, in the *Supplement.*

76. Europe.

Europe is nearly one third larger than the United States, exclusive of Alaska. This continent forms the western part of Eurasia.

Europe may be divided into three regions, — mountainous highlands in the southwest, lower highlands in the northwest, with lowlands between the highland regions and

also spreading far to the northeast. Many peninsulas and seas make the coast of Europe more irregular than that of any other continent.

Almost the whole of this continent is in the cool belt. Only the southern peninsulas project into the warm belt.

Europe is in the path of the westerly winds. The west coast therefore receives the heaviest rainfall, but a fair amount of rain falls in the interior, though becoming less and less as the farther inland regions are reached. The rainfall around the Caspian sea is light.

Owing largely to the winds from over the drift of the Gulf stream, the western part of Europe has a much milder climate than the Atlantic and Arctic coasts of America at the same distance from the equator.

The many seas which border on Europe help to give much of it an even climate; but the great plain in eastern Europe is far away from the Atlantic ocean and therefore has hot summers and cold winters.

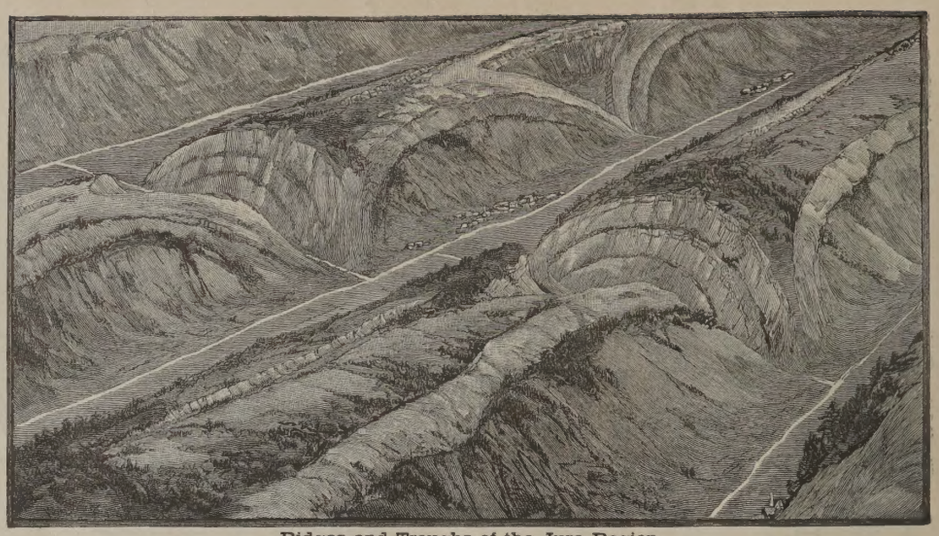
77. Region of the Alps.

The outlet of the Black sea separates the plateau region of southwest Asia from a chain of highlands stretching westward to the Atlantic coast. The Alps which form the mountain-center of southwest Europe are about as high as the Rocky mountains in the park region.

The Alps have many sharp peaks, for they are too young to be greatly worn down. They are not nearly so old as the Appalachian highland. Slight earthquake shocks are frequent in the Alps and are taken to mean that the mountains are still growing higher.

As in other young and steep-sided mountains, there have been many snowslides and landslides in the Alps. Villages have thus been destroyed and many people killed. Violent blasts of wind are brushed down by large snowslides and advance even beyond the snow, blowing down trees and houses.

Among the Alps are great snow-capped peaks down whose sides long glaciers slowly wind, melting in the valleys. Mt. Blanc, the loftiest of these peaks, is about three miles high, — a little higher than Mt. Whitney in the Sierra Nevada. The snow-cap on Mt. Blanc reaches halfway down its sides.



Ridges and Troughs of the Jura Region.

Beautiful lakes abound near the margins of the Alps. The Rhone river flows into and out of Lake Geneva, while the waters of Lake Lucerne find their outlet in a branch of the river Rhine.

Thousands of cattle graze in the valleys among the Alps. As the warm season approaches and the winter snow melts away, the cattle are driven to the grassy slopes high up the mountain sides. The cold season finds the herds again in the lower valleys. Cheese is a valuable product in this highland region and is a leading article of export.

The Alps are pierced by several railroad tunnels. The St. Gotthard tunnel is nearly ten miles long, — the longest in the world. It connects the Swiss plateau with the basin of the Po river. Mt. Cenis tunnel is near the western end of the Po basin.

There is very little coal in the Swiss plateau, but swift streams supply plenty of power for the mills and factories. The Swiss people weave large quantities of silk and cotton goods, and make many fine watches.

The western part of the Alps bends southward between the valleys of the Po and the Rhone. This part of the mountain chain extends to the shore of the Mediterranean sea. A long branch called the Apennines runs the entire length of the peninsula of Italy.

On the western side of the Rhone valley rises the broad range known as the *Cevennes*. These mountains are much older and lower than the Alps and contain the sources of many streams flowing westward to the Atlantic.

The Jura mountains extend from the Rhine river southwest into the valley of the Rhone. They consist chiefly of low arches or folds, so young that they have not yet been greatly worn. *See picture on opposite page.*

From lake Geneva the Rhone river follows a winding course through the southern part of the Jura ridges and then unites with the Saone, turning almost due south.

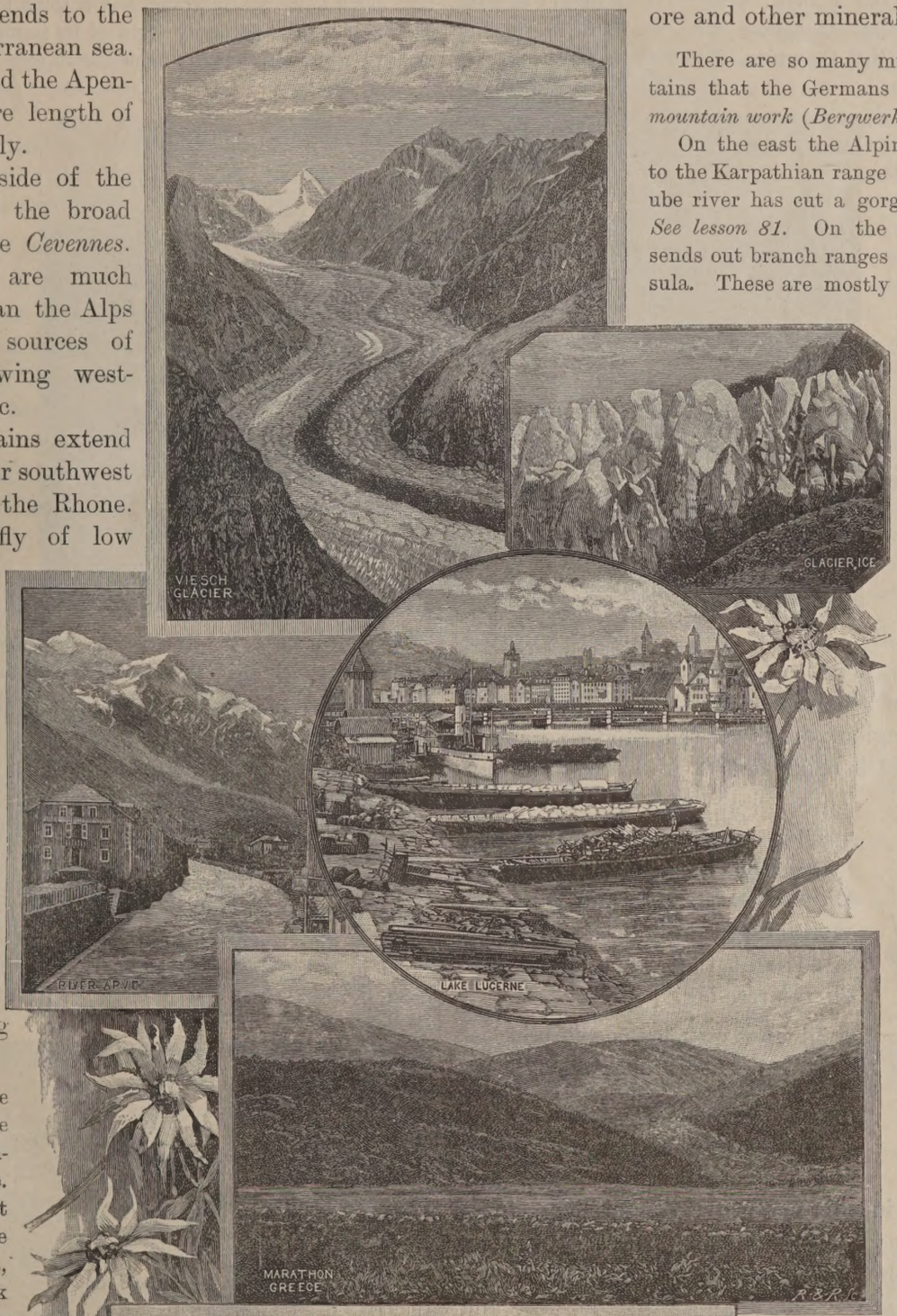
The mulberry tree upon whose leaves the silkworm feeds is common in southern Europe. The city of Lyon, at the junction of the Rhone and Saone rivers, has the largest silk manufactories in the world.

The Rhone, like all other rivers flowing into seas having only faint currents, is making a delta. This river is so rapid that only steamers can stem its current above the delta plain, and thus reach Lyon.

On the north of the Swiss plateau, many old and low mountains extend far out into Germany. The surface of these mountains has been worn down to layers of rock that were once deep in the earth. They are rich in iron ore and other minerals.

There are so many mines in these old mountains that the Germans speak of all mining as *mountain work* (*Bergwerk*).

On the east the Alpine highland reaches out to the Karpathian range through which the Danube river has cut a gorge called the *Iron Gate*. *See lesson 81.* On the southeast the highland sends out branch ranges into the Balkan peninsula. These are mostly low, like the mountains shown in the picture of *Marathon*, on this page.



78. The Spanish Peninsula.

The great peninsula in southwest Europe is known as the *Spanish peninsula*.[1] The lofty Pyrenees mountains extend across its isthmus. This great peninsula is shared by two countries, — Spain and Portugal.

Among the mountains of southwest Europe, the Pyrenees are next in height to the Alps and form a lofty barrier between France and Spain. Railroad lines have been built around the ends of the Pyrenees range.

Far in among these mountains is the little state of *Andorra*. It occupies a few small but elevated valleys. There are only a few thousand people in the entire state, and most of them are shepherds.

It is claimed that more than a thousand years ago, Andorra was set free for the help its people gave to the Franks, or people of ancient France, in their wars against the Moors who then held parts of Spain. Andorra is now free only in name. The little state pays tribute both to France and to a Spanish bishop.

[1] This peninsula is sometimes called the *Iberian peninsula*, after the Iberian tribes which lived there long ago.

Some of the buildings made by the Moors may still be seen in the Spanish peninsula. Grandest of all is the *Alhambra*, — the palace and fortress of the Moorish kings. It is in the city of Granada. This was the last stronghold of the Moors in Spain, and was captured the year that Columbus first set sail for the New World. *See map of Europe in the Supplement.*

A few hundred thousand people known as *Basques* live in the Cantabrian mountains of northwest Spain. The Basques are the remnant of early tribes that once held the Spanish peninsula. These mountains, like many others in the world, are a place of refuge for the descendants of a conquered people. The Basques are mostly shepherds.

The Alhambra, — Moorish Palace, Spain.

The Spanish peninsula consists mainly of broad table-lands, with a border of narrow coastal plains on the east and the west. Mountain ranges almost inclose the upland region, and other ranges extend across it. The general level is about half a mile above the sea. This broad upland surface is swept by chilly winter winds and is parched by summer sunshine. Only the spring and autumn months are mild. The rainfall is so light that the plateaus are almost treeless.

Spanish Milkman.

In what direction do the principal mountain ranges in the Spanish peninsula extend? Where is the Sierra Nevada of Spain?

Describe the courses of the Ebro and Guadalquivir rivers.

The river valleys in this peninsula are fertile. Those of the Ebro and Guadalquivir rivers form the broadest lowlands, but even these are not very broad. The narrow coastal plains also are fertile. Those on the west and southwest coasts receive heavy rainfall; those on the east are well irrigated from immense reservoirs in the uplands.[1] Wheat and barley are the chief grain crops, but the peninsula is noted for its vineyards and orange groves. Wine is the chief article of export.

On the southern coast of Spain, near the strait of Gibraltar, a small but famous peninsula extends into the sea. The body of the peninsula consists of a mass of rock about two miles and a half long, known as the *Rock of Gibraltar*. This Rock was once an island, but sandy waste filled in the strait at its northern end, and now a flat neck unites the Rock with the mainland.

[1] Many of the reservoirs were built centuries ago by the Moors.

Gibraltar is a fortress belonging to the British nation. The north and east sides of the huge rock are very steep, but the west side has a more gentle grade, and a town has been built at its foot. This side is also strongly fortified by immense walls and galleries, most of which are heavily armed with cannon.

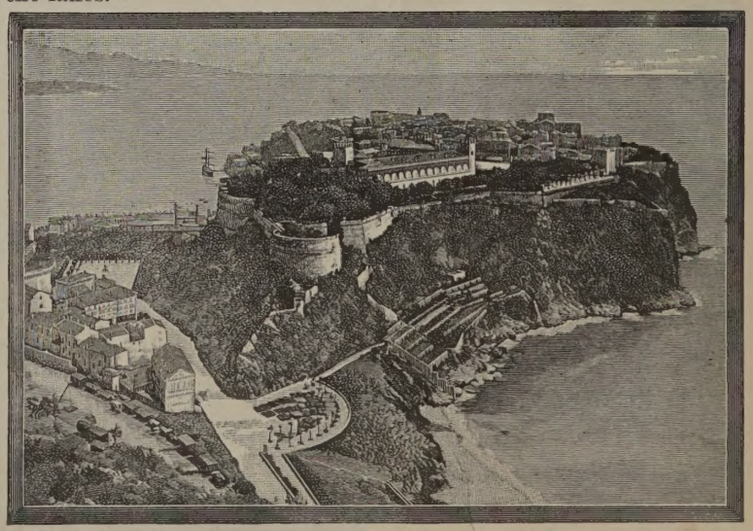
79. The Po and the Apennines.

Following the Mediterranean coast from Spain to Italy, we pass *Monaco*, the smallest state in Europe. The total area of the state is only about eight square miles. It is near the southeast corner of France. The city of Monaco, in the state of the same name, occupies a rocky headland, as shown in the picture.

The Po river flows through a plain that is not many feet above sea level. This plain is made of waste worn from the Alps and the Apennines. The lowland consists of flood and delta plains.

The melting snow and ice in the high Alps feed many of the Po branches. One of these flows from a glacier on Mont Blanc.

Along the northern border of the plain, near the foot of the Alps, are some of the Alpine lakes that are famous for their beauty. Among these are Como, Garda and Maggiore. These lakes lie in places where the country seems to have been bent down, changing parts of the river valleys into basins. Former glacial action has aided in scouring out the lake basins, and much waste brought down by the ice still lies in heaps, or moraines, around the foot of the lakes.



Monaco.

The Adige river drains part of this lowland but does not join the Po. The floods of these rivers are so dangerous that long banks, or dykes, have been built to confine the water. As the streams continue to fill their channels with waste from the mountains, the dykes are built higher. In some places the surfaces of the rivers are now higher than the plain.

The streams flowing from lakes into this lowland are clear, but those coming directly from the mountains carry sand and finer rock waste, and are building up the plain.

The marshy deltas of the Po and the Adige are rapidly growing into the Adriatic sea. Some places that were once seaports are now several miles inland. Along the coast, sandy islands almost inclose lagoons.

The city of Venice is built on islands in one of these lagoons. In this city, canals partly take the place of streets. Boats called *gondolas* are seen everywhere on the canals.

Venetian Gondolier.

Irrigating canals reach almost every part of the valley of the Po and the Adige, making it one large garden. Grains of all kinds thrive there, and the foothills are covered with vineyards. The meadows are mowed five or six times a year, — yielding fine grass for dairy cattle. Mulberry trees abound.

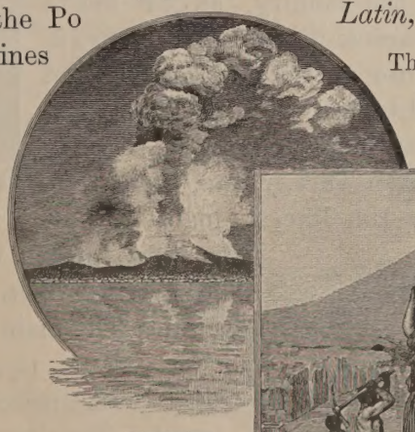
Milan, the largest city in the Po valley, is a great railroad center and therefore a distributing point for exports and imports.

Railroads from this city lead through the St. Gotthard and Mt. Cenis tunnels, about which we read in lesson 77. The St. Bernard pass is one of the most famous passes in the routes over the Alps from the Po valley. Since the building of the railroads, these lofty passes have been little used by travelers.

Pass of St. Bernard.

From the fertile plains in the north, the Apennines extend towards the southeast through the entire length of the peninsula of Italy. This range is older than the Alps and has no such lofty peaks as those rising on the northwest of the Po basin, but the upper parts of the Apennines are buried in snow all winter.

Cold winds from the northeast often sweep over the Apennines, but the foothills and coastal plains southwest of the range are sheltered and produce many kinds of fruit. Among these are oranges, lemons, olives and grapes. This region is also famous for mulberry trees. Silk is the most valuable export from Italy.



Vesuvius.

There are many volcanoes in southern Italy and the neighboring islands, but there is only one *active* volcano on the mainland of Europe. That one is *Vesuvius*, near the bay of Naples, on the southwest coast of Italy.

Many centuries ago the fertile sides of Vesuvius were covered with vines and olive trees. The people who then lived on the slopes of the volcano did not know that their home was near a crater that might at any time pour forth lava and bury them.

There came a time however[1] when a great cloud of steam and dust rose from the crater and spread far out over the land and the sea. Lightning played among the clouds, and showers of ashes fell on the groves, the vineyards and the cities.

For three days the thick dust shut out the sunlight. Bright flashes lit up the clouds, as the gases burst out and blew off the top of the glowing mass of lava. The hot steam changed to rain and mingled with the ashes, making rivers of mud that flowed down the mountain sides, sweeping away the vines and trees and burying the cities. When the eruption ceased, the layers of mud and ashes were so deep that no trace of the houses could be found. Centuries passed and people no longer knew where the cities were buried; but beneath new vineyards and mulberry groves[2] lay many works of art, and the ruins of temples, homes, baths and paved streets. Some of these have now been dug out, and they teach us a great deal about the customs of the Roman people who lived in that early time.

After this eruption, Vesuvius was not very active for about fifteen hundred years. Then it again became violent and killed thousands of people. Now and then the volcano breaks forth, but not with such force as in ancient times.

Mt. Etna, on the island of Sicily, is the loftiest volcano in Europe, yet it is only a little more than half as high as Chimborazo.

Italian Piper.

Rome, the most noted of ancient cities, stands on the banks of the Tiber, a small river flowing from the Apennines in middle Italy. About one third of the words in our language are derived from *Latin*, — the language of the ancient Romans.

The beautiful Terni falls, shown in the picture on page 76, are about 70 miles north of Rome. The water in one part of the falls leaps down 330 feet.

Excavations in Pompeii.

On the northeast slope of the Apennines, not far from the source of the Tiber, lies the small free state of San Marino. The state covers only thirty-two square miles and has a population of about 8000;

[1] The eruption took place in 79 A.D. The cities of Pompeii, Herculaneum and Stabiæ were buried.

[2] The eggs of the silkworm were first carried from China to Europe about 550 A.D., — nearly five centuries after the great eruption.

but small as it is, San Marino is a very old state. Most of the people in this small state tend cattle or raise wine grapes.

The leaning tower shown in the picture is in *Pisa*, a city on the Arno river, Italy. Two thousand years ago, Pisa was only two miles from the mouth of the Arno; now it is six miles, for the river has meanwhile built its delta out into the sea.

The famous leaning tower is 183 feet high, and it leans 13 feet from an upright position. The walls of the tower are very thick and are made of marble.

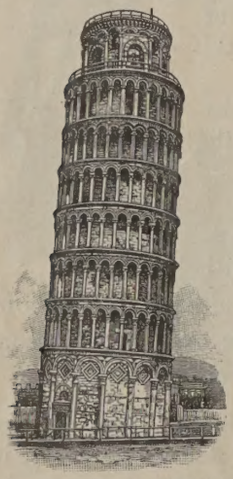
San Marino.

80. The Balkan Peninsula.

Many ranges branch from the eastern end of the Alps. Some of these turn towards the southeast and divide into smaller ranges forming the highland in the Balkan peninsula. This broad peninsula stretches from the Black sea to the Adriatic.

The Balkan range is the highest in the peninsula. These mountains extend east and west along the southern border of the Danube basin.

Forests of pine and oak grow on the Balkan slopes and in other parts of the rugged highland of this peninsula. Thousands of swine feed on the acorns. The roses which thrive near the Balkan range yield a perfume known as *attar of roses*.

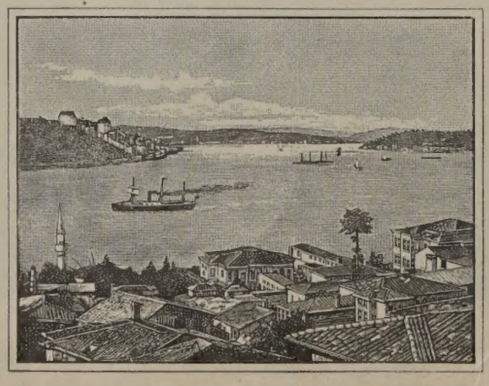


Leaning Tower of Pisa.

The lowlands in the Balkan peninsula are very fertile. More than one half the land is arable, or fit for plowing. The hilly portions afford good pastures.

The middle belt of the Balkan peninsula is occupied by Turkey. Owing to the poor way in which the country is governed, the people are shiftless and do not make good use of their land. Wheat, raisins and tobacco are valuable products. Constantinople, on the strait called the *Bosphorus*, is the chief port of Turkey.

The Pindus mountains are low, but they run like a backbone through the southern part of the peninsula. There, in the small country of Greece, many deep and broad valleys lie between the branches of this range.



The Bosphorus.

On the plain of Marathon, shown in the picture on page 77, the ancient Greeks won a great victory over a large army of Persians. This plain lies between the mountains and the sea. Most of the mountains in Greece are small and greatly worn, like those which overlook the plain of Marathon.

The broken coastline of Greece, and the many bordering islands, show that this land has been partly drowned. Most of these islands are spurs from the Pindus range, not wholly covered by water. Some of the islands are of volcanic origin.

The southern part of Greece is a peninsula having a very narrow neck known as the *isthmus of Corinth*. A ship canal has been cut through this isthmus. The small raisins of Greece are called *currants*, — a corruption of the word *Corinth*. Currants are the most valuable product which Greece sends to other countries.

Apollo Belvedere.

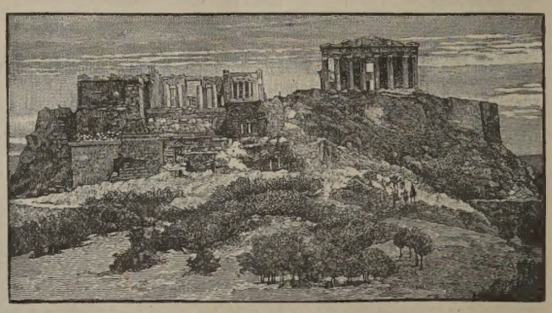
Many years ago the Greeks were famous for their learning and for their works of art. They built grand temples in which they placed beautiful statues made of marble or of ivory and gold. Many of the marble statues and the ruins of some of their temples still exist. The most famous temples were built on a fortified hill known as the *Acropolis*, in Athens.[1]

81. The Plain of Hungary.

Where does the Danube river rise? Describe its course. Name a mountain range on the north of the Danube basin. Name a range on the south.

The Karpathian mountains partly divide *High Europe* from *Low Europe*.

The lowland part of the Danube basin which lies southwest of the Karpathian mountains is known as the *plain of Hungary*. This is a young plain which was formerly the bed of a lake. The leading products are sugar beets and grain. The plain of Hungary supports nearly one fourth as many people as there are in the United States. The Danube and its branches form a water way to almost every part of the plain. The main river affords an outlet eastward.



The Acropolis, Athens.

The Danube leaves the plain of Hungary at the place where the inclosing ranges on the eastern side of the old lake basin are lowest. The river has there cut a long gorge across the range. This gorge is known as the *Iron Gate*. *See picture, page 77.*

[1] On the highest part of this hill stood the *Parthenon*, — grandest of all the temples. Within and without the Parthenon were statues and friezes which rank foremost among ancient sculptures. Many of these are now preserved in the British Museum, in London.

The *Apollo Belvedere*, a copy of a beautiful Greek statue, is now in the Belvedere gallery of the Vatican in Rome.

In the gorge the river flows swiftly over a rocky bed. A large amount of money has been spent in blasting away the rocks in the river, and a long canal has been built past the rapids.

Below the gorge the river wanders through fertile lowlands on its way to the Black sea. The Danube is building a great delta through which a ship channel is with difficulty kept open.

Norwegian Hunter.

In the upper part of the Danube basin, large forest areas have been cleared. In rainy seasons, therefore, the water now runs quickly to the streams, washing gravel into the valleys, and causing floods in the lowlands. An attempt is being made to reforest the upper slopes.

Far the greater part of the Danube basin is in the country of Austria-Hungary, which includes the plain of Hungary. The leading articles of export from that country are beet sugar, grain and lumber. Vienna, the largest city, is built near the place where the Danube river leaves the mountain district on the west and enters the plain of Hungary.

82. The Scandinavian Peninsula.

The Scandinavian peninsula is the largest peninsula in Europe, — being more than a thousand miles long. The highland in this great tongue of land is very old, like that in the Laurentian highland.

The Scandinavian highland was once worn low, then raised again, cut by deep valleys, and at length partly drowned.

The western slopes of this highland are steep and rugged. They descend to many long and deep fiords. Along the coast are countless islands formed by the partial drowning of the highland.

The western slopes of the Scandinavian highland resemble the sides of the Alps in having glaciers, torrents, falls, lakes and forests; but unlike the Alps, the old Scandinavian mountains are often flat-topped, and together they form a rugged plateau.

There are some small ice-sheets on the Scandinavian highland. Long ago the ice-sheets were much larger. They then spread to the lands on the south and east of the Baltic sea and its arms. These ancient ice-sheets scraped out many basins where lakes are now found. They also deepened valleys that are now drowned, forming fiords.

The Sogne fiord, the largest of the drowned valleys, is more than a hundred miles long. *See picture on page 82.* Streams on the highland leap down the cliffs into the fiord.

Norwegian Cart.

Along the west coast of the great peninsula extends a series of banks over which the water is shallow. Beyond them the water is very deep. These banks, like the shoals along many other shores, abound in fish.

The Lofoden islands form a group off the northwest coast of the peninsula. The tide rushes with great force between two of these islands. Boats are sometimes lost in this strong tide, known as the *maelstrom*.

The eastern slope of the Scandinavian highland is more gentle than the western, and descends to a rolling lowland. Many rivers cross this lowland and flow into the gulf and sea on the east and south.

There are many beautiful lakes in this peninsula. Of these the most useful are lakes Wenner and Wetter. *See Plate N.*

The Scandinavian peninsula is in the path of the moist westerly winds. The steep western slopes therefore receive much heavier rainfall than the lowland on the east.

Although the northern part of this peninsula lies within the Arctic circle, no portion is in the cold belt. The mildness of the climate along the coast of this northern land is largely due to the drift from the Gulf stream part of the North Atlantic eddy.

In winter the sea and gulf on the east of the peninsula, as well as the wide straits leading into them, are frozen over, for here the mild winds from the ocean do not enter. At the same time, the ocean around North cape is free from ice. Thus the heat given to ocean currents in the torrid zone proves a great blessing to people in this far-away land.

The North cape is so far from the equator that in the warm season the sun for more than two months does not sink below the horizon. During the cold season there is a night of equal length. The other days and nights vary in length from a few minutes to twenty-four hours.

North Cape, Norway.

Two countries comprise the greater part of the Scandinavian peninsula. They are Norway on the west, and Sweden on the east. Nearly all the people in these countries belong in the white race, but the Lapps in the north are a branch of the yellow race.

Some of the Lapps keep herds of reindeer. Others catch fish in the lakes, streams and sea. In winter their land is buried in snow and ice.

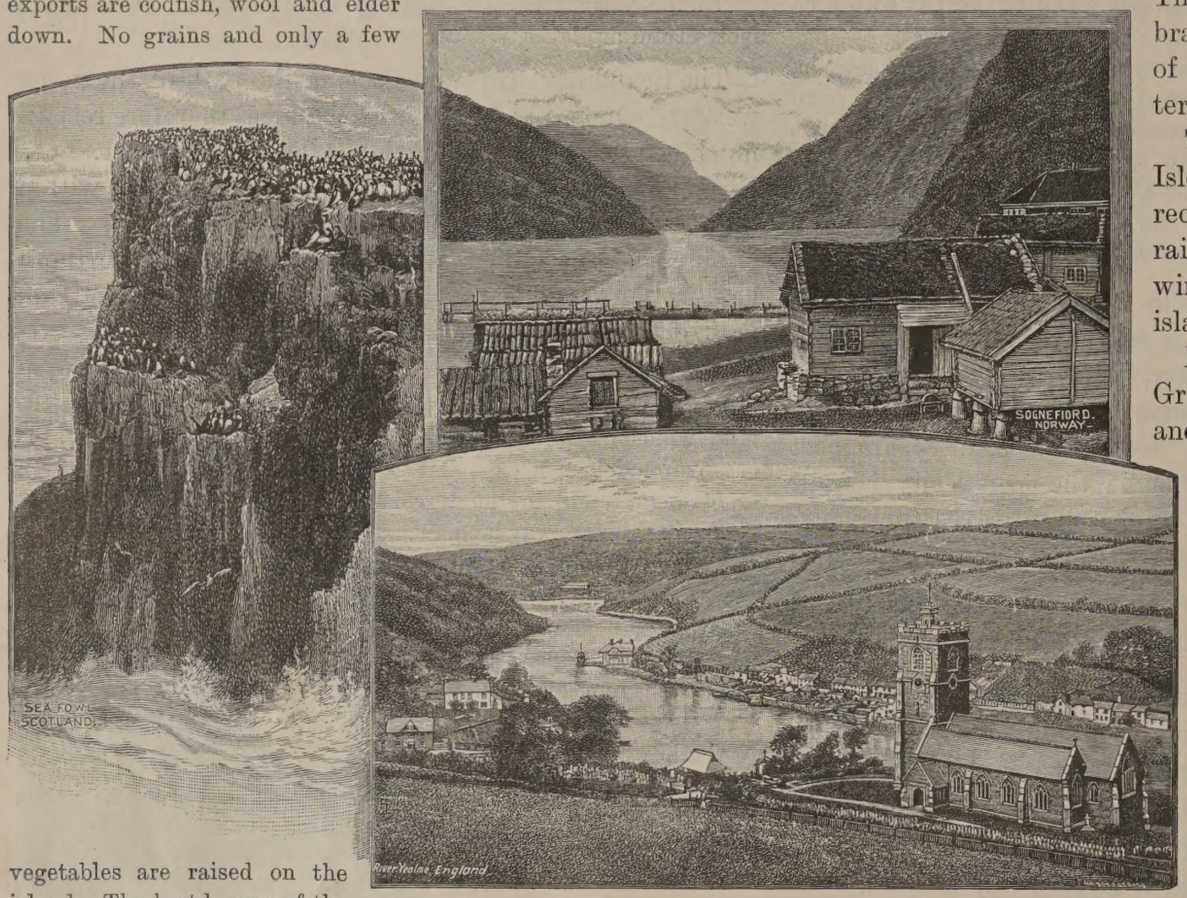
Large crops of grain are raised in the southern lowland of the Scandinavian peninsula, and there most of the people live. This peninsula is in the great forest belt which extends from the Atlantic ocean to the Pacific. Norway pine and fir are leading exports. There are also rich mines of iron ore in the old rocks of the peninsula.

The people in these countries carry on trade chiefly through the two large cities of Stockholm and Christiania.

The peninsula and islands of Denmark form a part of Scandinavia. The surface, climate and products of Denmark are similar to those of the lowlands in southern Sweden and Norway. The people of these three countries, except the Lapps, are called *Norsemen*, meaning *northmen*.

Iceland and the southern part of Greenland belong to Denmark. Iceland is a volcanic island about 300 miles long. Its middle region is a table-land less than half a mile above sea level and covered with lava and sand. Parts of the island are buried in ice.

Most of the people in Iceland live near the coasts. The chief exports are codfish, wool and eider down. No grains and only a few vegetables are raised on the island. The best-known of the Iceland volcanoes is Mt. Hekla. It has been in eruption several times since the island was settled by the Danes. Volcanic dust from Mt. Hekla has been carried as far as the Scandinavian peninsula. Iceland is remarkable for its geysers, one of which throws a column of water about one hundred feet into the air.



83. The British Isles.

Two large islands and many smaller ones form the group known as the British Isles. Largest of these is Great Britain, the most important island in the world, yet it is only one fortieth as large as the United States. Ireland is second in size among the British Isles.

The British Isles are at about the same distance as the Labrador peninsula from the equator, but the islands enjoy a mild climate and even seasons, while the peninsula has low temperature with severe seasons. A great branch of the North Atlantic eddy drifts past the coast of the British Isles and tempers the westerly winds which prevail there. The westerly winds over Labrador bring great changes of heat and cold from the interior of North America.

Jaunting Car, Ireland.

The slopes of the British Isles which face the Atlantic receive of course the heaviest rainfall from the westerly winds, but all parts of the islands are well watered.

Most of the high land in Great Britain is in the north and west parts. There the rocky coast, like that of western Scandinavia, is broken by many fiords and fringed with small islands. The south and east parts of the island are mostly lowland, with clayey or sandy shores.

The island of Great Britain is in three divisions. What range of hills separates Scotland from England? Where is Wales?

The northern portion of Scotland is very rugged, but it contains no lofty chain like the Alps.

The Scottish highlands consist mainly of lofty uplands and long narrow valleys. Some of the uplands are flat-topped, like those of the Scandinavian highland.

Ben-Nevis is the highest point of land in the British Isles. It is a rounded mountain, not quite two thirds so high as Mt. Mitchell.

On the summit of Ben-Nevis there is a weather observatory where winds and clouds are constantly observed. Much has thus been learned about the upper air currents from over the North Atlantic ocean. This is one of the few high-level observatories in the world.

Culloden Monument.[1]

Many of the streams in the Highland glens spread into beautiful lakes, or *lochs*. These may be counted by hundreds. They were formed by glacial action, like the lakes in the northeast part of our country.

The cattle and sheep of the Scottish highland take high rank in quality. This region is so rugged that it is thinly peopled. The Highlanders are mostly descendants from a race of brave people that were long ago driven from the lowlands by invaders from the mainland of Europe.

[1] This monument at Culloden marks the site of the battle which decided the fate of the house of Stuart, a royal family in Scotland.

Southward from the Scottish highlands spread the rolling or hilly lowlands of a fine farming district. Under many of the farms are mines of iron ore and of coal.

Where is the Clyde river? A rich farming and mining belt crosses the Clyde basin and extends to the coast both on the east and the west. *See map on page 75.*

Owing to the nearness of iron and coal, the city of Glasgow, on the Clyde river, has become a great manufacturing center. Iron steamships built on the banks of the Clyde may be seen in all the large ports in the world.

Scotch Highlander.

The mountains in England and Wales are little more than high hills. Southward from the Cheviot hills, the highland gradually becomes so low that it merges into the lowland. In Wales, the ranges are higher than in England. This highland district in England and Wales is good grazing land. It is also one of the richest coal and iron regions in the world. Many large manufacturing cities are therefore located in this part of Great Britain. Their foreign trade is carried on chiefly through the great ports of Liverpool on the Mersey river, and London on the Thames.

Scene on the Coast of Ireland.

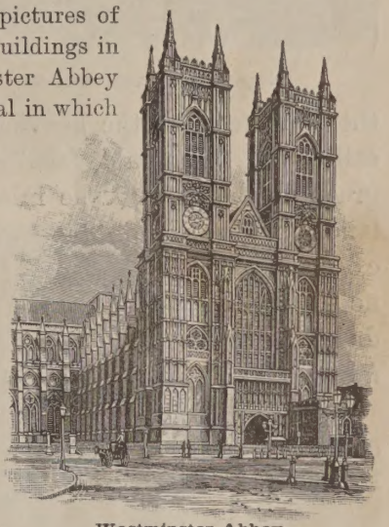
The middle and southeast parts of England form a rich farming and grazing lowland, but it cannot raise enough grain and cattle to feed the millions of people who live in that country. Shiploads of wheat, corn and beef are sent from the United States to England. Shiploads of cotton also from our Southern plains are sent to the English mills. In return we receive many kinds of cloth and of iron goods.

Tower of London.

Before coal was used in factories, and before iron was needed for engines and machines, the farming lowlands of England formed the richest part of the country. Western England, with its mines and factories, has now far outstripped the eastern lowlands, not only in wealth, but also in population; not because the farms are poorer, but because the manufacturing districts made the greater progress.

London, the largest city in the world, is on both banks of the Thames. This is the longest stream in the British Isles, yet it is little more than one half as long as the Hudson river. The Thames, the Hudson and the Mersey valleys are all slightly drowned, forming deep water ways. They carry the shipping for the largest three seaports in the world,—London, New York and Liverpool.

On this page are pictures of two of the famous buildings in London. Westminster Abbey is a very old cathedral in which for centuries the rulers of England have been crowned. The *Tower of London* is an ancient fortress or castle. Many famous men and women have been imprisoned there and then executed near by, but it is no longer used for a prison.



Westminster Abbey.

Many centuries ago, the site of London was the place where a number of roads met on the banks of the Thames. Marshes and forests made the roads converge in that neighborhood and there a town was started. At first the river was crossed by a ferry; then as the town grew to a city a bridge was built. Many large bridges now cross the Thames in London.

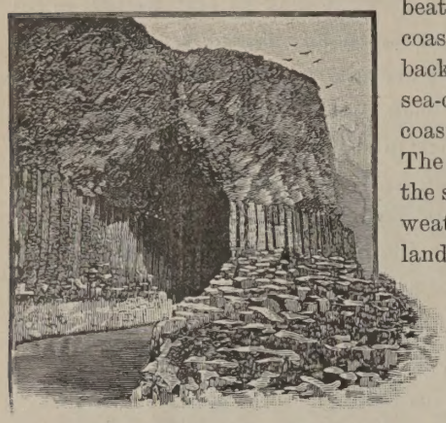
The slight drowning of the Thames valley carries the deep tidal waters as far up the river as London. When the people of England began to trade by way of the ocean, London became the principal trading station, because the city stood at the highest point on the river where ocean vessels could meet the river boats and exchange cargoes with them.

No other city in Great Britain is so well situated as London to carry on commerce with the mainland of Europe.

The British nation now has a great number of large and small colonies or possessions scattered over the earth. Among these are Canada, Australia and India. London owes its growth largely to the trade of the British people who reside in the colonies. Before 1776, the eastern part of what is now the United States was a British possession.

The groups of low mountains or hills in Ireland are mostly near the coast. The inland district is a wide plain.

The heavy rollers, or storm-waves, from the North Atlantic beat violently against the rugged coast of western Ireland and cut back the headlands into high sea-cliffs. For this reason the coast is dangerous for shipping. The waves beat so strongly on the steep cliffs that even in fair weather boatmen can hardly land without seeking one of the harbors in the bays.



Fingal's Cave, Isle of Staffa.

Ireland, in the path of the westerly winds, lies to windward of Great Britain and therefore receives the heavier rainfall. Ireland is often called the "Emerald Isle," because the grass there is green all the year. The inland district has fine grazing lands, and the country is noted for its dairy products.

Giant's Causeway, Ireland.

Large areas of the plain in Ireland are low and boggy. They are so level that they cannot easily be drained and are therefore of little value for farming or grazing. Thick layers of decaying moss cover the bogs and supply a kind of fuel known as *peat*, or *black turf*. The peat bogs are therefore of great service.

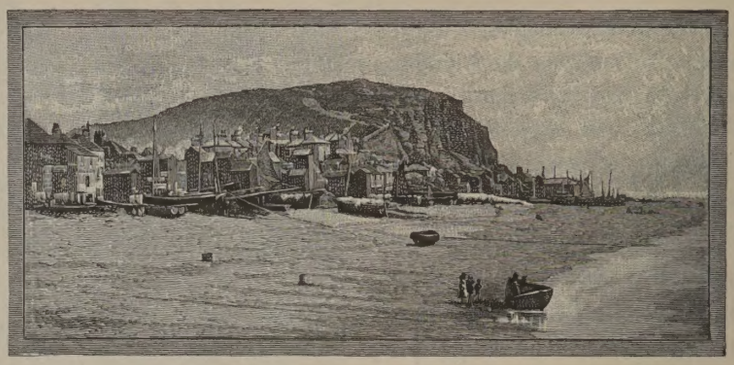
The soil in many parts of Ireland is suited to the growth of flax. Among fiber plants, flax ranks next in value to cotton, for cloth making. The flax grown in Ireland is made into the fine linen for which the city of Belfast has long been noted.

Lakes of Killarney, Ireland.

The small pictures on this page show some of the places of greatest interest on or near the coast of the British Isles.

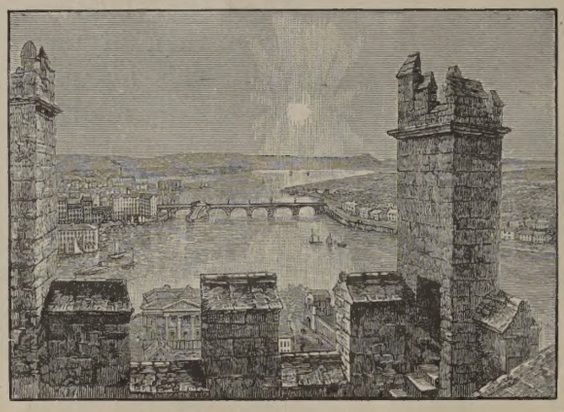
The *cliffs of Dover* face the strait of Dover. The high shore is made of chalk and in clear weather can be seen from the coast of France. On the French coast also are white cliffs that can be seen from Dover. These high banks, like all other shore cliffs, show that the coasts are wearing back, and that the strait of Dover was once narrower than it now is.

Land's End is a cape at the southwest point of England. This cape is not far from the tin mines of Cornwall.



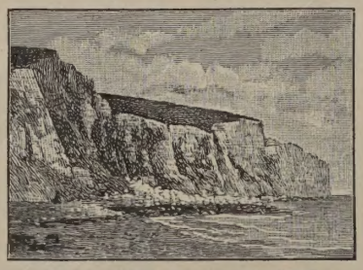
Hastings, England.

Hastings is a fishing town southeast of London. Not far from this town a famous battle was fought nearly a thousand years ago, when *William the Conqueror* crossed over from France and invaded England. This is known as the battle of Hastings.



Shannon River, Ireland.

Giant's Causeway is on the north coast of Ireland. *Fingal's Cave* is on the island of Staffa, off the west coast of Scotland. The rocky columns, shown in these pictures, are made of lava. Sheets of lava, in cooling, are often divided by cracks into countless columns like these. The beautiful *lakes of Killarney* are among the low mountains of southwest Ireland. The *Shannon river* drains the middle lowland of the Emerald Isle.

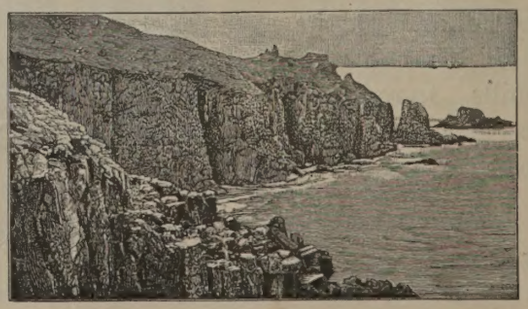


Chalk Cliffs, Dover, England.

84. Low Europe — Western Part.

West of the Alpine highland lies the lowland of France. In what general direction do the rivers of this lowland flow? Name two of them.

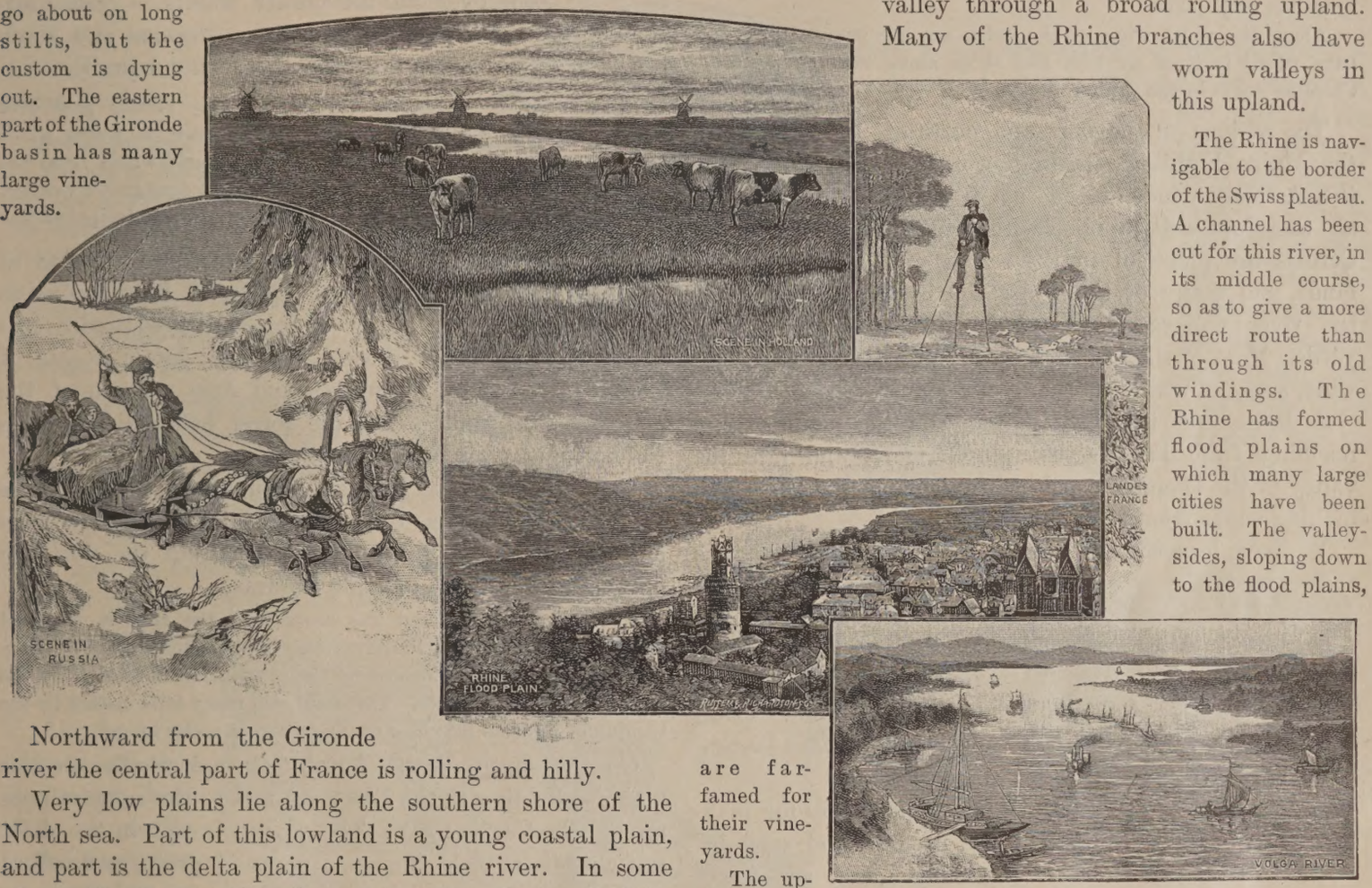
Between the Pyrenees and the wide mouth of the Gironde river extends a young coastal plain, low and flat. This region is known as the *Landes* and consists of wide marshes and sandy tracts.



Land's End, England.

Northward from the middle Pyrenees stretches a gently-sloping alluvial fan built of waste from the mountains. The length of this fan, from the mouth of the mountain valleys to its outer edge, is about fifty miles.

The people in the Landes are mostly shepherds. Some of these go about on long stilts, but the custom is dying out. The eastern part of the Gironde basin has many large vineyards.

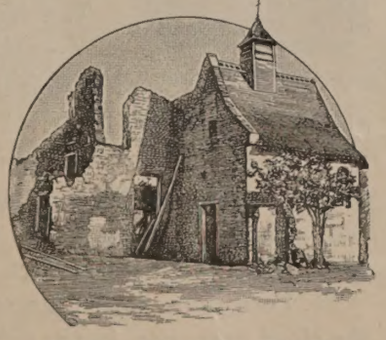


Northward from the Gironde river the central part of France is rolling and hilly.

Very low plains lie along the southern shore of the North sea. Part of this lowland is a young coastal plain, and part is the delta plain of the Rhine river. In some places, the land surface has sunk below the level of the sea, and dykes have been built to keep out the salt water. Portions of the plain have been reclaimed from the sea. Lagoons were surrounded by dykes to prevent more water from flowing into them and were then pumped dry.

The coastal plain forming part of this lowland is covered with a layer of sand containing seashells, and is therefore known to have been formed under the sea. Beneath the sand are layers of peat made of land plants, showing that the region was dry land before the sandy layer was deposited by the sea. In the peat are found Roman coins about two thousand years old. These coins show how very young the coastal plain must be, for it is younger than the peat. This part of Europe must have been under the sea and raised again within the last two thousand years.

Canals form a network over these lowlands and afford cheap water ways to all parts of the low country. Thousands of windmills are kept busy pumping water from the fields into the canals. A man's wealth may there be counted in windmills and cattle. One portion of these flat plains is known as *Holland*, or the *Netherlands*, — meaning *lowerlands*. On the southwest is Belgium.



Battle-scarred House, Waterloo, Belgium.

The Rhine river, above its delta plain, has cut a deep valley through a broad rolling upland. Many of the Rhine branches also have worn valleys in this upland.

The Rhine is navigable to the border of the Swiss plateau. A channel has been cut for this river, in its middle course, so as to give a more direct route than through its old windings. The Rhine has formed flood plains on which many large cities have been built. The valley-sides, sloping down to the flood plains, are far-famed for their vineyards.

The upland through which the Rhine flows is an old mountain region worn low and even, and then raised again. This is the old region mentioned near the close of lesson 77.

Most parts of these low mountains are wooded, and the Germans therefore speak of them as *forests* and not as *mountains*. Thus, they refer to the *Black forest* (*Schwarzwald*) — meaning *Black mountains*. In the forests are firs, pines, oaks and beeches, — both soft-wood and hard-wood trees.

This old upland region, rich in iron ore and coal, extends across Belgium and into France; also, eastward through Germany. The old mountains which rise above the upland are the hardest parts of the region, not yet worn down to the general level.

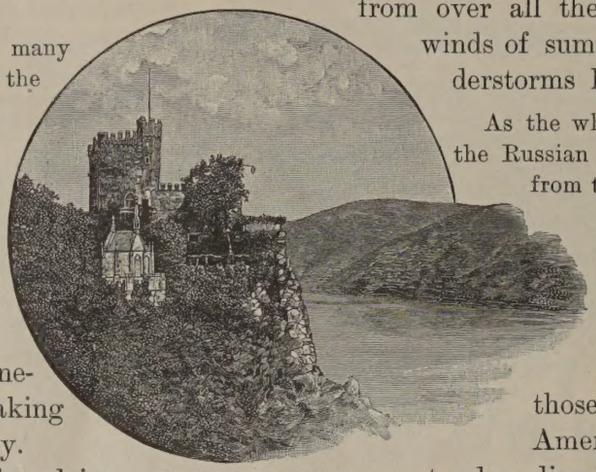
The battle-scarred house shown in the picture is near the village of Waterloo, about nine miles southward from Brussels, in Belgium. The house was torn by shot and shell in the great battle of Waterloo, in which the power of Napoleon was broken. This famous French general was banished to the lonely island of St. Helena, where he died. *See map on page 89.*

Northeastward from the Netherlands, low swampy or sandy coastal plains border on the North and Baltic sea-coasts. These lowlands are crossed by the Elbe, the Oder and the Vistula rivers, flowing from the border of the highland region.

In this lowland ended the ancient ice-sheets which crept from the snowy Scandinavian highland across the Baltic sea. *See lesson 82.* As the ice melted at its southern end along the coast of Germany, the rock waste which had been dragged along formed many low hills, or moraines. In the hollows among these moraines lie countless little lakes.

Along the south shore of the Baltic sea are many bays partly inclosed by bars like those along the Carolina coast in the United States.

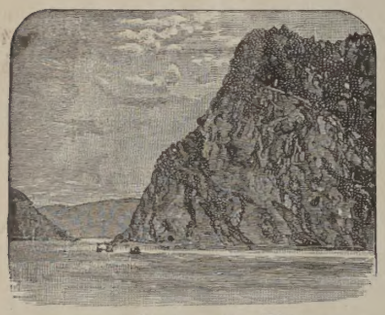
The regions on the west and north of the Alpine highland are in the path of the westerly winds of the cool belt and are therefore well supplied with rainfall. Cereals are plentiful in the rolling uplands, and many of the sunny slopes of the river valleys are covered with vineyards. Most of the grapes are used in making wine, some of which is sent to our country.



Castle on the Rhine.

A large and thriving industry, on the plains reaching from France through Germany and into the valley of the Danube, consists in raising sugar beets and making sugar from their juice.

We have learned that iron ore, coal and other minerals abound in the old mountain uplands. These products have led to the building of mills and factories of almost every kind. Cloth and iron goods are leading manufactures.



Lorelei Rock on the Rhine.

Excellent clay for making pottery, and sand for making glass, are found in many parts of the region west and north of the Swiss highland.

The western part of Low Europe is thickly settled, because the climate is good, the country is suited to easy travel, and products are plentiful. Among the great centers of trade are Paris, Antwerp, Amsterdam, Hamburg and Berlin.

85. Low Europe — Eastern Part.

The great lowland of eastern Europe is known as the *plain of Russia.* It forms with the Siberian plain the northern lowland of Eurasia. The plain of Russia stretches from the Black sea and the Caucasus mountains to the Arctic coast, and includes one half of the continent.[1]

One of the richest petroleum fields known in the world is in the region of the Caucasus mountains. Oil abounds near both the east and the west ends of the range. In recent years much attention has been given to the boring of wells, and to the refining and shipping of the oil. This region now rivals the oil fields in the northern part of the Allegheny plateau.

[1] Mt. Elburz, in the Caucasus range, is the highest mountain in Europe, but its summit is nearly 1000 feet lower than that of Mt. Logan.

The cold and heavy winter air of the interior plain of Russia helps to keep out the sea-winds. The heaviest rainfall therefore is in summer when the heated air is light and is easily pushed upward by the cooler winds from over all the border waters. These sea-winds of summer cause showers and thunderstorms like those on our prairies.

As the whirling westerly storms pass over the Russian plain they draw in warm winds from the south and cold winds from the north, giving changeable weather like that in the Mississippi valley.

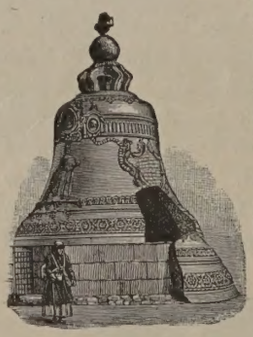
The northern portion of the plain of Russia consists of frozen treeless tundras like those along the Arctic coasts of America and Asia. South of the tundras lies the forest belt which crosses the northern plain of all Eurasia.

The portion of the Russian plain known as *Finland* is very flat and contains thousands of lakes. The southern half of Finland is in the forest belt, but the northern part merges into the desolate tundras.

The surface of Finland was scoured by the ancient ice-sheet which spread out from Scandinavia. This region, like New England, has many lakes formed by the scouring of the ice or by the heaping of its rock waste. There are also many falls caused by the turning of streams into new channels across rocky ledges.

On the south of the forest belt are fertile treeless plains extending to the Black sea and to the salty steppes around the Caspian sea. The plains, except in the drier salty portion, yield immense crops of grain, and afford pasturage to large numbers of cattle, horses and sheep.

Through the forest belt and across the plains flows the Volga, the largest river in Europe. The Volga basin comprises about one fifth of the plain of Russia. The main river in this basin rises in marshes near the Valdai hills. These hills are only a few hundred feet above sea level, but many large streams rise in or near them.



Old Bell of Moscow.

For a long distance the Volga flows eastward, separated by an almost level plain from the Dwina on the north. Into what bodies of water do these rivers flow?

The Volga river, with its network of canals, forms the main water way through the Russian plains. It reaches almost all parts of the forest and grain districts, the mining region in the Ural mountains, the fur belt in the Dwina basin, the oil wells near the Caucasus range, and the salt beds around the Caspian sea. These water routes lead to all the border seas of the plain of Russia.

St. Petersburg is the largest city in Russia. Odessa is the chief grain port in the southern part of the great plain.

86. Africa.[1]

A deep and wide canal about one hundred miles has been dug across the isthmus of Suez. The canal has no locks, for the two seas which it connects are on about the same level.

Before the Suez canal was made, the water route from all ports in Europe to India led around the cape of Good Hope. Vessels can now go through the canal and thus save about 4000 miles in the voyage. Port Said is at the Mediterranean end of the canal. *See picture on page 90.*

The canal is used chiefly by steamers and they pay a high toll. Sailing vessels that pass through the canal are towed, and as the expense is very great, nearly all vessels that depend on sails and wind go round the Cape.

Africa has a rounded outline, broken by very few bays. Almost the entire continent is a highland. Its average height above sea level is double that of Europe. The southern half is higher than the northern, and the eastern part is higher than the western. The coastal plains are very narrow, because the border ranges of the highland lie near the sea. Almost all parts of the continent inland from the coast ranges consist of plateaus.

Water Carrier of Morocco, Northern Africa.

All the great rivers of this continent have falls or rapids, and not a stream is open very far inland to large vessels from the sea. Great areas in Africa are deserts. The coastal regions near the equator are very unhealthful. For these and other reasons, large parts of Africa are still little known. Until the present century, only parts of the coastal regions of the "Dark Continent" had been explored, except the lands in the north; but we know far more about inner Africa to-day than was known about inner North America one hundred years ago.

[1] The map studies on page 89 are to precede this lesson.

Africa is the hottest of the continents. Only the extreme southern part of this great land mass is in the cool belt.

A wide region across the middle of the continent is visited by the equatorial rains. The southeast coast is in the path of the trade winds from over the Indian ocean. These winds give rainfall to the seaward slopes of the highlands in their path, but give very little moisture to the inland region of southern Africa.

Woman of Morocco.

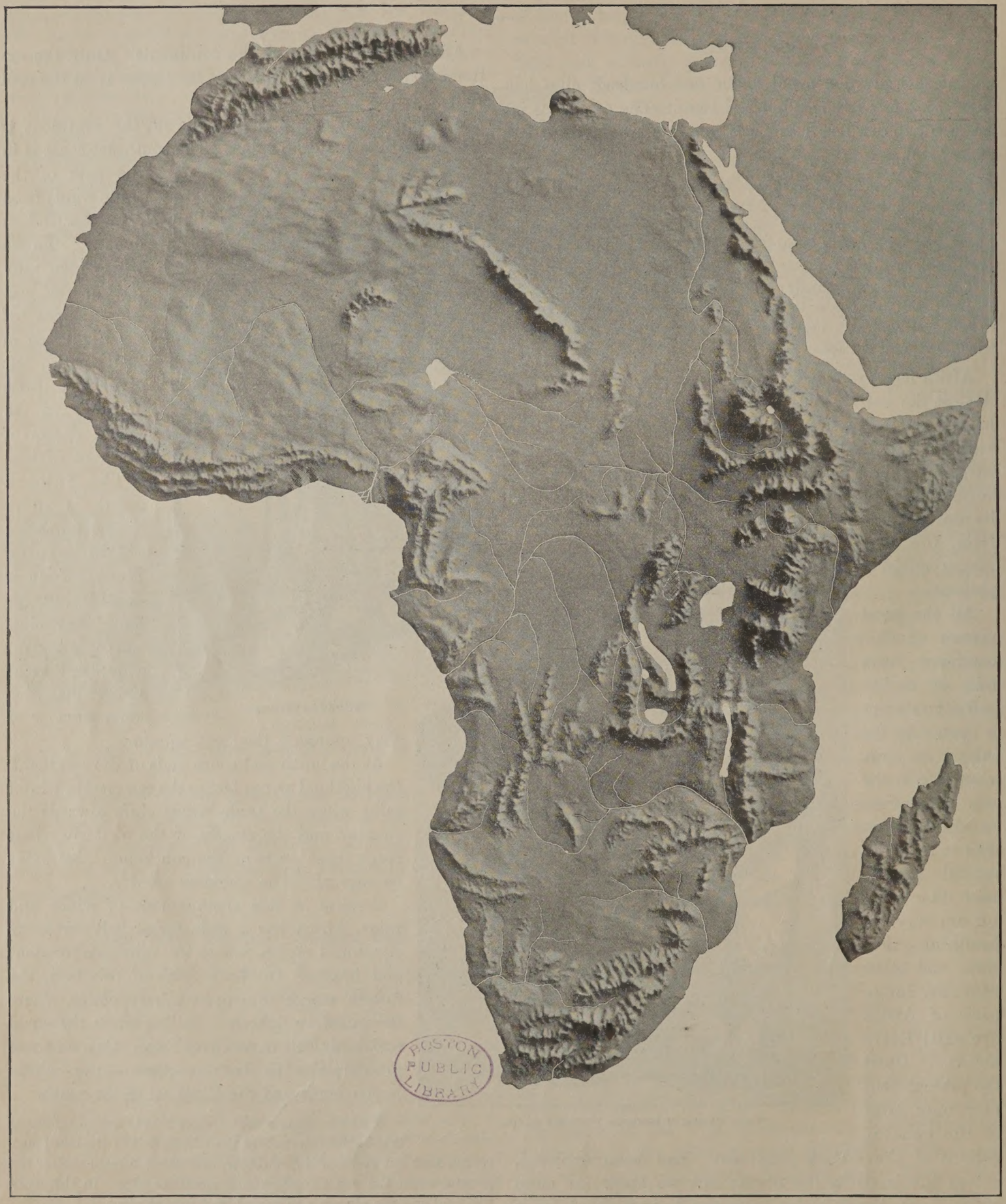
The Sahara desert is swept by the northeast trade winds. Their effect is very drying, because they blow mostly from over wide land areas and gradually become warmer as they approach the heat equator.

At the north and south ends of the continent, the highland slopes facing the sea receive winter rains when the trade winds shift towards the equator, and the storms of the westerly winds reach those parts of the continent. *See maps on page 24.* The summers are dry.

Because of this arrangement of winds and rains, Africa has a wide forest belt across its equatorial region, where the rains are frequent and heavy. On both sides of this belt, the forests merge into open grassy plains, where the rains are lighter, — falling when the equatorial rain belt moves over them. Beyond these grassy plains lie desert regions, — the Sahara in the north and the Kalahari in the south.

Near the equator the summer heat is not so strong as it is in the deserts. In the middle belt of the continent, clouds shut out much of the sunshine, and dense forests shelter the ground when the sun shines from a cloudless sky. In this belt, the land and the air are also cooled by frequent rains.

Intense summer heat is felt in the Sahara and Kalahari deserts, but especially in the former, although it is so far from the equator. There are neither trees nor grasses to shield the surface. During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RELIEF MAP OF AFRICA.

the day, the dry sand or rock is quickly heated, and in turn heats the air. During the night, the bare surface and the cloudless air often become very cool.

The southern half of Africa is not so hot as the northern. In the south the continent is narrower and the interior is nearer the sea. The inland regions are therefore sooner reached by sea-winds, with clouds and occasional rains.

87. Map Studies.

Note: Now that we have studied four continents, we should be able to *read maps*, without the aid of many questions.

Describe the position of Africa with regard to the other continents and the oceans.

Sketch the map of Africa. Which of the continents that we have studied does it most closely resemble?

How does Africa compare in size with North America? With Asia? *Compare globe maps.*

What does the relief map show about the surface of Africa? Describe the courses of five large rivers in this continent.

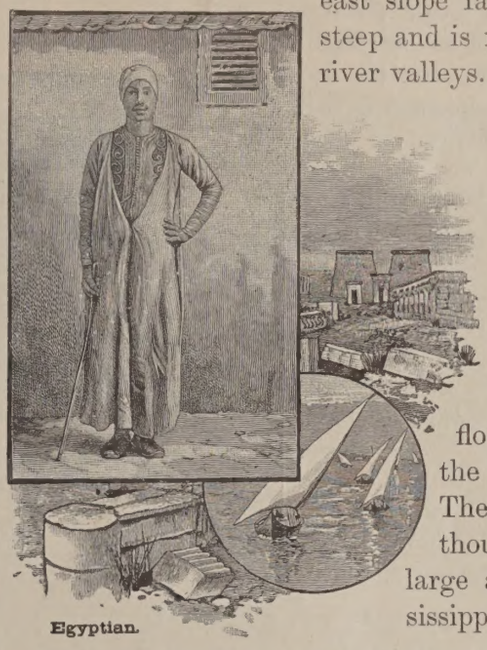
Refer to the maps on pages 21, 24 and 25, and tell what you can about the heat belts and seasons in Africa, — the winds which carry moisture to it, — and the ocean currents which reach its shores.

In what respects is Africa like any other continent? In what respects does Africa differ from each of the other continents?

What seas almost sever Africa from Eurasia? What isthmus connects the two land masses?

88. Egypt and the Nile.

The highest plateau in Africa is that of Abyssinia. Its east slope facing the Red sea is steep and is not broken by large river valleys. The west slope is more gentle and is drained by branches of the Nile river.



Egyptian.

The main river of the Nile system rises in the lake region of middle Africa and is the only large river flowing northward to the Mediterranean sea. The basin of the Nile is thought to be about as large as that of the Mississippi.

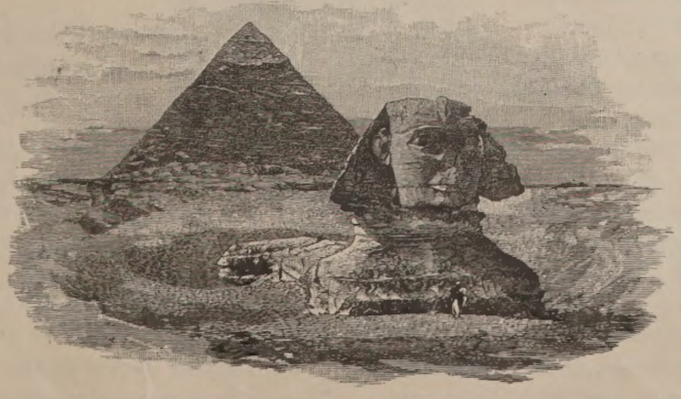
Where is lake Victoria (Victoria Nyanza)? On which side of the equator does the greater part of this lake lie?

Lake Victoria is about three fourths of a mile above sea level. Its outlet is the river Nile.

Name two Nile branches that rise in the highland of Abyssinia.

For about five hundred miles along the White Nile, above its junction with the Blue Nile, there is only a narrow fringe of verdure. The rainfall is light and the country on both sides of the river resembles the steppes of Russia. In some places however are park-like plains where grassy tracts alternate with groves. Giraffes and elephants browse in the wooded parts of the plains. Acres of lilies float on the still water of the river, and many crocodiles and hippopotamuses swim about.

The Blue Nile and the Atbara are the main branches from the east. During the northern summer, when the equatorial rains reach the highland of Abyssinia, many torrents pour down these tributaries; but as the dry season approaches, the torrents dwindle away till only muddy



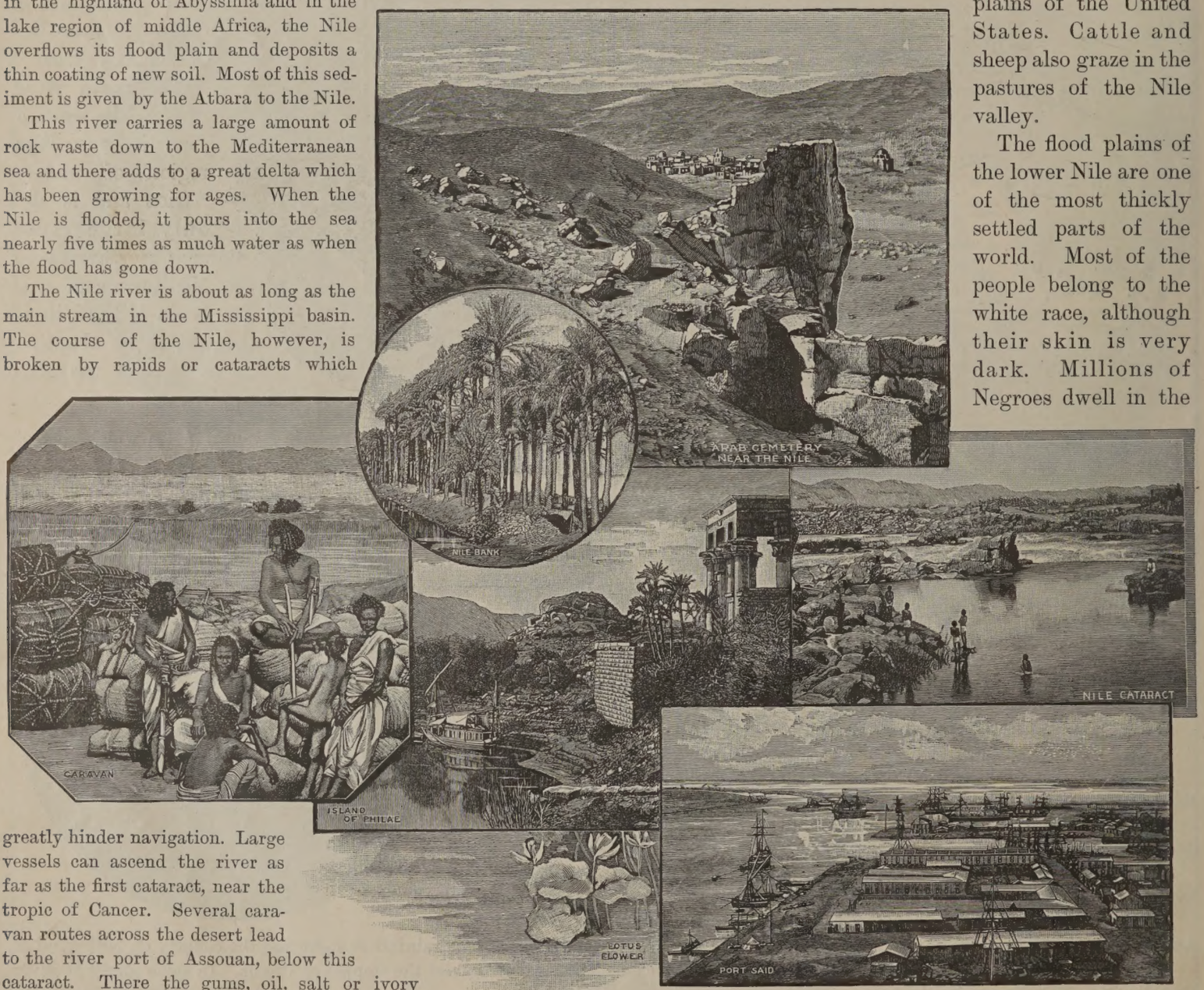
Sphinx and Pyramid, Egypt.

pools or even dry channels remain. The deeply-cut beds of these streams show that a great amount of waste has been carried away. A large part of the finer waste is borne down the Nile.

For hundreds of miles this great river flows through the desert and does not receive a single tributary. There the river has cut a long and broad valley and has made a flood plain several miles in width. Every summer, after the equatorial rains have fallen in the highland of Abyssinia and in the lake region of middle Africa, the Nile overflows its flood plain and deposits a thin coating of new soil. Most of this sediment is given by the Atbara to the Nile.

This river carries a large amount of rock waste down to the Mediterranean sea and there adds to a great delta which has been growing for ages. When the Nile is flooded, it pours into the sea nearly five times as much water as when the flood has gone down.

The Nile river is about as long as the main stream in the Mississippi basin. The course of the Nile, however, is broken by rapids or cataracts which greatly hinder navigation. Large vessels can ascend the river as far as the first cataract, near the tropic of Cancer. Several caravan routes across the desert lead to the river port of Assouan, below this cataract. There the gums, oil, salt or ivory carried for hundreds of miles by camels, can be placed on boats and floated down to the large cities in the delta plain. Small vessels can be hauled over the first cataract and can then sail up to the second. There are many boats on the river between the upper cataracts.



Entrance to Suez Canal.

How different is the basin of the Nile from that of the Mississippi! One has only a narrow strip of fertile land with wide deserts on either side. The other also has its fertile flood plain, but this is bordered by uplands of wonderful fertility.

How different are the rivers in these great basins! The Nile is open to large vessels for only about five hundred miles in a direct line from its mouth, and within that distance there is not a single tributary. The Mississippi and its branches afford thousands of miles of water navigable from the sea and leading to almost every part of the wide fertile plain.

The Mississippi river becomes broader and deeper as it flows onward, but the Nile becomes narrower and shallower in its lower course. Can you tell why?

In harvest time on the fertile delta and flood plains of the Nile may be seen cotton, sugar cane, rice, wheat, corn and other products like those raised on the Southern plains of the United States. Cattle and sheep also graze in the pastures of the Nile valley.

The flood plains of the lower Nile are one of the most thickly settled parts of the world. Most of the people belong to the white race, although their skin is very dark. Millions of Negroes dwell in the basin of the upper Nile, in middle Africa.

Cairo, the trade center of the delta and flood plains of the Nile valley, is the largest and most important city in all Africa. It is a very old city.

In Lower Egypt are found the greatest monuments ever built by man. They are known as *pyramids* and are the tombs of the ancient kings. *See picture on page 89.* Several pyramids can be seen from the citadel of Cairo. One of these is now 450 feet high, and the length of each side of its square base is about 750 feet, or nearly one seventh of a mile.

The Sphinx shown in the same picture is not far from Cairo. This curious monument, showing a man's head on a lion's body, is nearly 200 feet long, and was mostly carved from a ledge.

89. Northern Africa and the Sahara Desert.

The highland which includes the Atlas mountains consists of long and narrow plateaus with border ranges. These plateaus, like other high plains between ranges, receive but little rainfall and are suitable only for pasture land.

An Arab City near a Water Gap.

Crossing the Sahara Desert.

The northern slopes of this highland receive rains from the westerly winds in winter. These slopes are fertile and produce cereals and fruits like those of southern Europe. The slopes of the highland which face inland are almost barren, because they are on the lee side of the mountains.

Most of the people in the lands on the north of the Sahara desert have dark or swarthy skin, but they belong to the white race.

The *Algerian*, or native of Algiers, shown in the picture on this page, is a fine example of the north African people.

Small streams from the Atlas mountains flow into the border of the desert, and even after they dwindle away, their ground water supplies many wells that have been sunk in that dry region. The water from these wells is used for irrigating groves of date palms, — the chief food plants of that district. Thousands of wells have been sunk along the border of the desert south of the Atlas range.

Algerian.

The desert of Sahara, though about as large as the United States, supports only about one fortieth as many people. Most of these live near the fertile places, or *oases*, where there are wells or natural springs. The desert tribes are mostly wandering Arabs, or *Bedouins*, and Berbers. Although their skin is swarthy they belong to the white race. *See picture of Bedouin on next page.* Many Negroes also live in some portions of the great desert lying northward from lake Tchad.

A few low mountain ranges rise in the desert. Rain occasionally falls on these ranges as the winds rise over them, and small streams then flow into the lower desert lands. During the winter months the highest peaks in the desert are capped with snow.

In the middle and eastern parts of the desert, the surface consists largely of stony table-lands. Some of these are a mile high. They are swept by hot dry winds which blow away the dust from their stony or gravelly surfaces.

Near the desert mountains and table-lands are many springs around which date trees grow. Some grain also is raised there.

The western part of the desert of Sahara is mainly a great sandy region in which countless dunes form. Some of these are more than six hundred feet in height. *See desert dunes, page 9.* Much less than half the great desert of Sahara is a sandy waste.

Violent winds, like the squalls of our thunderstorms but without rain or clouds, often raise great quantities of dust in the Sahara. These hot winds, called the *simoon*, sometimes darken the sky with dust. Caravans hardly survive the stifling heat and dust of the simoon. The camels crouch to the ground, and the men wrap their heads in their cloaks.

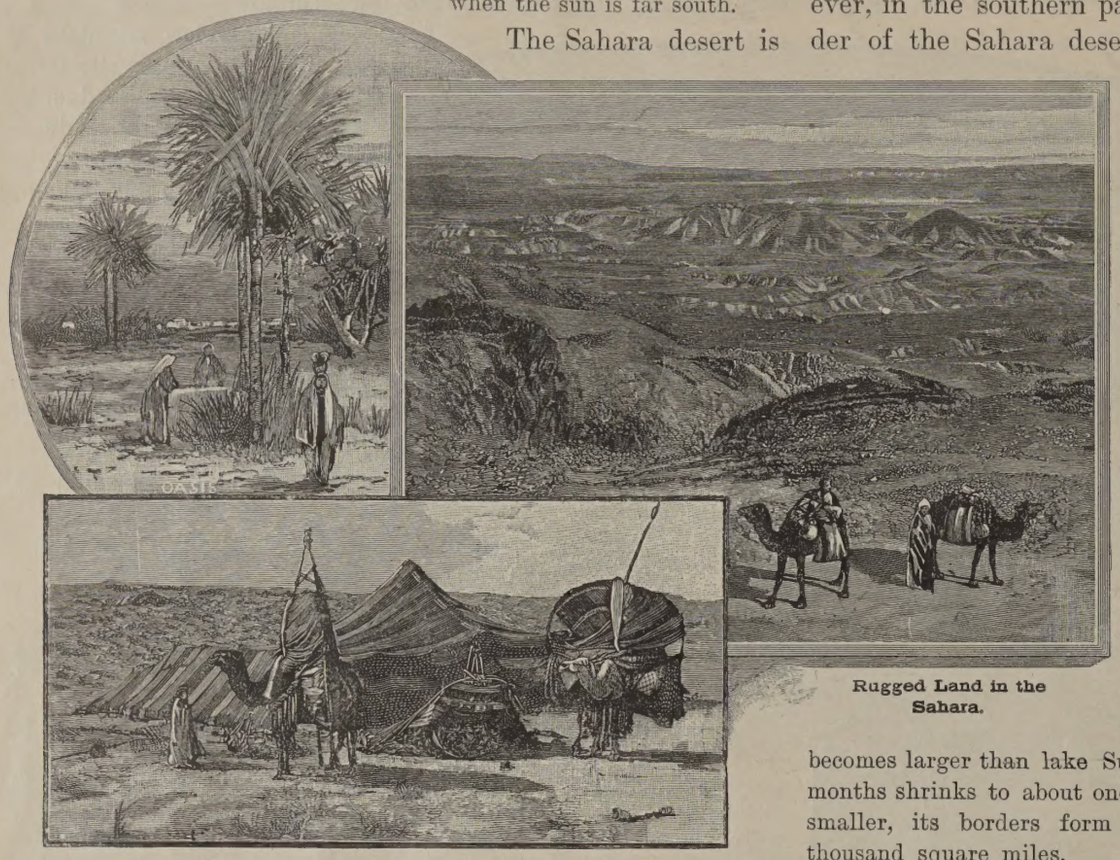
Along the southern base of the Atlas mountains, near their eastern end, is found a long depression leading from the Mediterranean sea into the desert. Some parts of this depression hold shallow lakes, as shown on the relief map. At one time it was thought that a large area in the desert could be flooded through the long depression, but more careful study has shown that only a very small area is below the level of the sea, while far the greater part of the desert is a plateau region.

The Sahara is the largest desert on the earth. This desolate region is too far south to receive rains from the westerly winds,

and too far north to be reached by the equatorial rain belt. Even along the Atlantic coast of the desert, there is no rain. The drying trade winds blow there almost all the year round. The winds are active in the daytime, but they generally fail after sunset.

Although hot in summer, the desert air, especially at night, is cool when the sun is far south.

The Sahara desert is part of a great belt of arid regions whose rainfall is so light that they have no overflow to the sea. The desert belt crosses Arabia, Iran, the Middle Basin and the Gobi region. A wide branch of this barren belt spreads northward around the Aral and Caspian seas.



Rugged Land in the Sahara.

Bedouin Camp in the Sahara Desert.

We have studied about the great mountain barrier of the Himalayas. The Sahara also forms a barrier between northern and southern Africa. No cattle, horses nor sheep are native to the lands south of the vast barren region, but many of these animals have now been taken there. On the other hand, middle and southern Africa have many kinds of animals that are not found north of the desert. *See page 116.*

We have read that the Himalayas rise between the yellow and the white races. The Sahara lies between the homes of the white and the black races, although large numbers of the white and the black people have now mingled in the border lands of the desert and in the desert itself.

90. Sudan.

A wide belt of country south of the Sahara desert is known as *Sudan*. It extends from the Atlantic coast to the highland of Abyssinia.

What gulf is south of western Sudan? What large river from Sudan flows into this gulf?

What lake receives the drainage of the interior region between the Niger and the Nile basins?

Sudan is wholly north of the equator but is within the range of the equatorial rains. They are heaviest, however, in the southern part, and decrease towards the border of the Sahara desert. Southern Sudan therefore is heavily forested, but northward the trees give place to open grassy plains which merge into the desert. The greater part of the country is fertile.

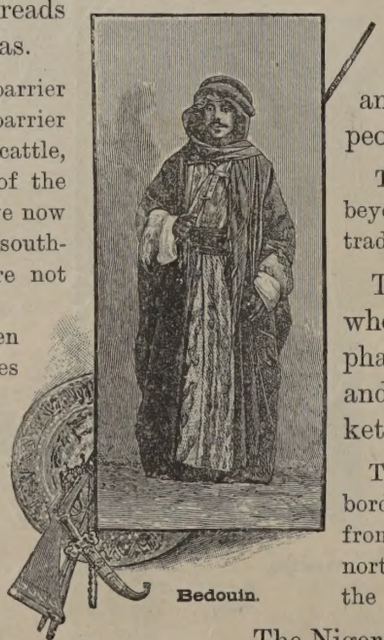
Eastern Sudan is in the Nile basin. *See lesson 88.*

The greater part of central Sudan is in the basin of lake Tchad, — the largest basin of interior drainage in Africa.

The main stream which feeds lake Tchad flows from the rainy forest country far in the southeast. Very little is known about the region in which the stream rises.

Lake Tchad is shallow and its banks are low. As the season changes from wet to dry, the lake varies greatly in size. In the rainy summer season, it becomes larger than lake Superior and then during the dry winter months shrinks to about one fourth its size. As the lake becomes smaller, its borders form swamps or marshes covering many thousand square miles.

When lake Tchad is swollen by rains, it overflows towards the northeast. The overflow follows a *wady*, or river channel that is dry except in the wet season. The wady from lake Tchad leads into the desert, where the water evaporates or disappears in the sand. This overflow keeps the water of the lake almost fresh.



Bedouin.

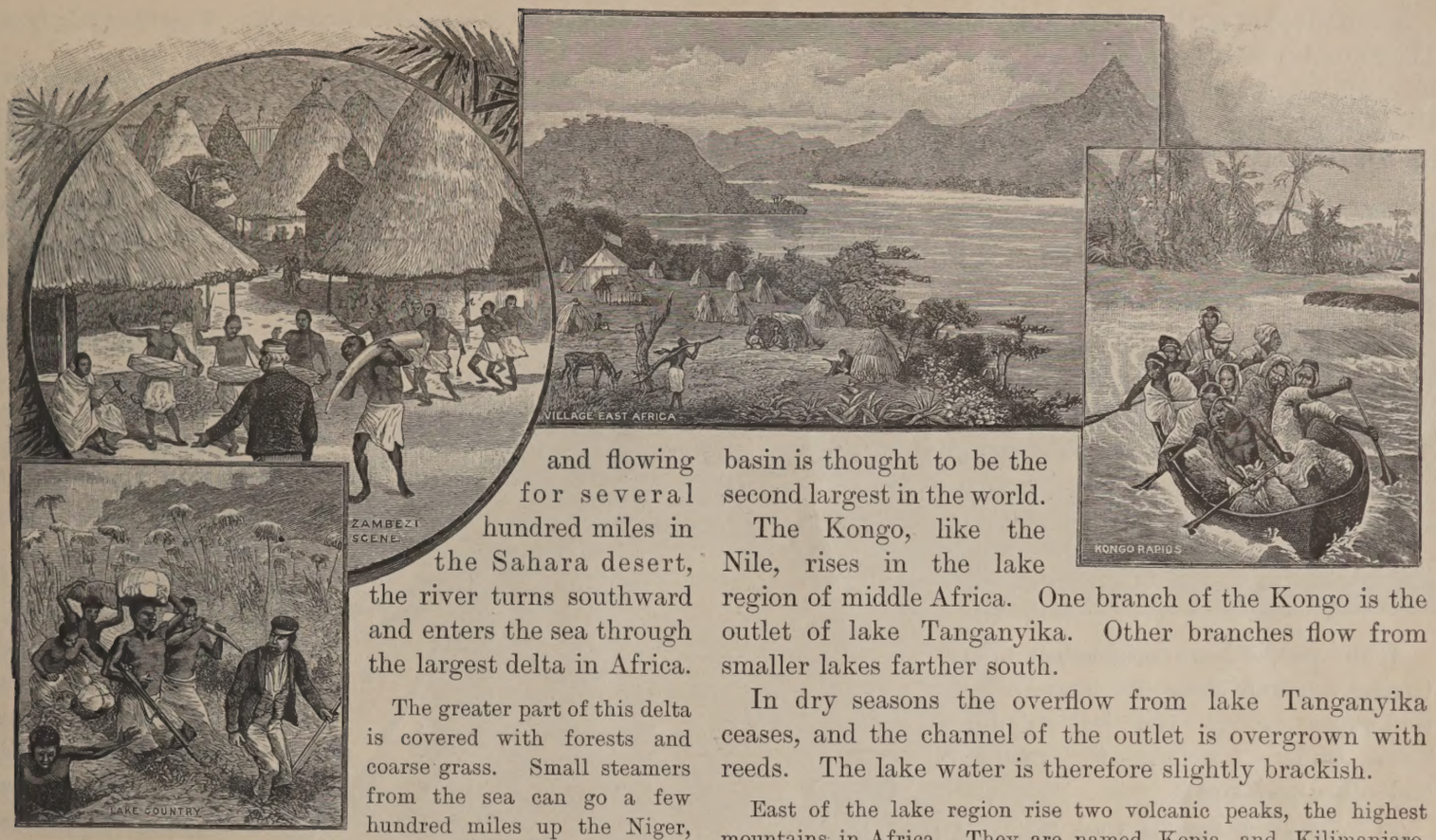
There are many large towns and villages in the park-like district south of lake Tchad, and the region is thickly settled. Most of the people are Negroes.

These people are well advanced in many respects beyond the savage state, for they carry on an extensive trade and have some manufactures.

The towns near lake Tchad are trade centers where caravans meet. The ivory tusks of elephants form a leading article of export. Camels and horses in large numbers are reared for market. Grain and cotton are important products.

The so-called *Kong mountains* are chiefly the southern border of a much-worn plateau that rises in broad terraces from the coast of the gulf of Guinea and spreads far northward. The inland slope of this old plateau is in the basin of the Niger river.

The Niger basin is thought to be about three fourths as large as that of the Mississippi. The Niger river rises in the hilly district near the southwest end of the old plateau region. After making a great bend northward,



and flowing for several hundred miles in the Sahara desert, the river turns southward and enters the sea through the largest delta in Africa.

The greater part of this delta is covered with forests and coarse grass. Small steamers from the sea can go a few hundred miles up the Niger, before their progress is stopped by rapids; but the steamers can ascend the Binue branch to a point about 600 miles from the river mouth. No other river in tropical Africa is navigable for so great a distance inland from the sea.

Timbuktu, on the Niger, was once an important center of the caravan trade, but it is now far surpassed by towns farther east, such as Kuka and Kano which together have a population of about 100,000. *See Africa in the Supplement.* Each year many camels cross the desert, carrying ivory, ostrich feathers and gold dust from the basin of the Niger. The caravans return southward with cloth, trinkets and salt.

The coastal regions south and southwest of the Niger basin are reached by the equatorial rain, and most parts of them are forested. White people from Europe have many trading stations along this coast. The products are like those of the Niger basin.

The western portion of Sudan, like nearly all other portions, is thickly settled. Most of the people are Negroes, but many others belong to a very dark branch of the white race, known as *Hamites*.

The Kamerun mountains near the head of the gulf of Guinea consist of one large volcanic peak and many small ones.

91. The Kongo Basin.

The Kongo basin occupies the greater part of middle Africa and lies west and southwest of the upper Nile basin. Almost all the Kongo basin is a plateau with a general slope westward. The average height of the region is about half a mile above sea level.

The Kongo basin is mainly in the southern portion of the equatorial rain belt and parts are heavily wooded. This basin is thought to be the second largest in the world.

The Kongo, like the Nile, rises in the lake region of middle Africa. One branch of the Kongo is the outlet of lake Tanganyika. Other branches flow from smaller lakes farther south.

In dry seasons the overflow from lake Tanganyika ceases, and the channel of the outlet is overgrown with reeds. The lake water is therefore slightly brackish.

East of the lake region rise two volcanic peaks, the highest mountains in Africa. They are named Kenia and Kilimanjaro. The former is about as high as Mt. St. Elias. The summit of Kilimanjaro is a little higher than that of Mt. Logan.

There are rapids and falls in the Kongo river at the place where it cuts its valley down from the plateau to the low and narrow coastal plain. These falls prevent vessels going far inland from the sea. Above the falls, the river is at all times wide, and during the rainy seasons it often spreads for miles from bank to bank.

Small steamers have been carried overland past the falls and now navigate the upper river. There they find an open water way for thousands of miles along the trunk stream and its branches.

The Kongo pours more water into the sea than any other river in Africa. For several miles out from the mouth, the fresh water of the great stream scarcely mingles with the salt water of the ocean. This large flow from the river shows how heavy the rainfall in the Kongo basin must be.

The vegetation of the Kongo basin is very luxuriant. Among the useful food plants are the cassava, the yam, the plantain, corn and sugar cane. Palm oil and cotton are other important products.

Palm oil comes from the seeds of certain kinds of palm trees. The seeds are crushed and then boiled or melted down, and are thus made to yield a valuable oil.

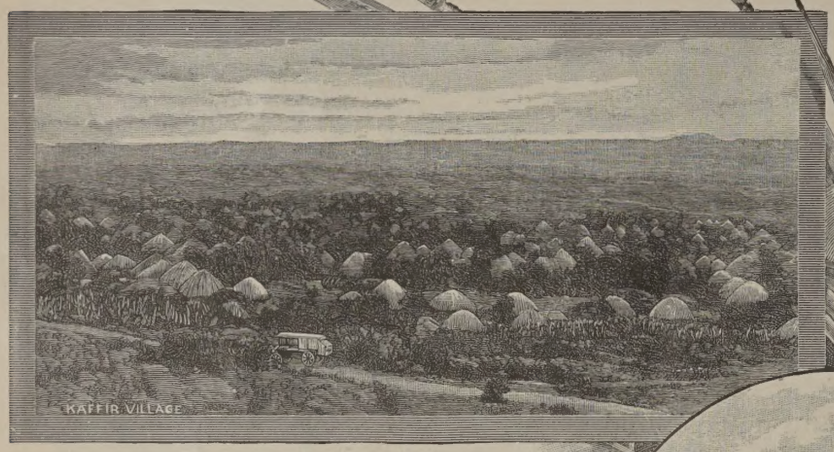
The yam is a large fleshy rootstock resembling the sweet potato. In nearly all hot parts of the world, yams are a common article of food.

Plantains and bananas are almost alike, but the pulp of the latter is the more delicate.

What have you read about cassava? *See lesson 60.*

The basin of the Kongo is the home of many large and fierce animals. Among these are the chimpanzee, the crocodile and the rhinoceros. Every year thousands of elephants are killed there for their tusks.

The natives of the Kongo basin belong to the black race. Their number runs far into the millions. They live mostly in small towns and villages. Many of the huts of these black people are made of grass, woven into mats and fastened to poles.



White people have established many trading stations along the coast and on the upper Kongo and its tributaries. These traders purchase ivory, palm oil and other products.

The two great forested river basins of the torrid zone differ widely in many respects. The Amazon basin slopes to the east; the Kongo, to the west. The one is mainly a lowland; the other, a plateau. The former has twenty-five thousand miles of streams navigable from the sea; the latter has only ninety miles. The Amazon basin is sparsely peopled by scattered tribes of Indians; the Kongo basin supports tens of millions of Negroes.

In what respects do these basins resemble each other?

92. Southern Africa.

In the Zambezi basin are found the same changes from forest to grass land and then to desert, as in Sudan. The forests of the Zambezi basin are densest in the northern part, where the equatorial rains fall in summer. The southern part of the basin reaches the Kalahari desert.

The Zambezi is the largest African river flowing into the Indian ocean. This stream is thought to drain an area equal to about two thirds that of the Mississippi basin.

Locate the Victoria falls. These falls mark the place where the river leaves the great inland plateau. At the falls the Zambezi river is a mile wide. The water plunges into a chasm about 400 feet deep, and then runs out through a narrow zigzag gorge.

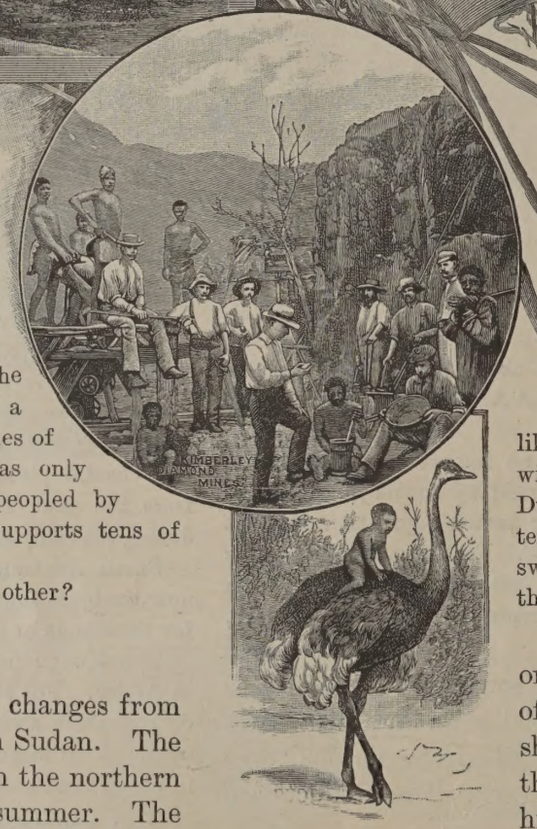
The Zambezi has built a large delta. The distributaries which cross it are generally barred with sand, but vessels that can float over the bars may ascend for about three hundred miles.

The natives of the Zambezi basin are savages of the black race. They raise grain and have herds of cattle.

The Kalahari desert is in the path of the trade winds from over the Indian ocean, but those winds lose most of their moisture on the seaward slopes of the eastern mountains. Very little rain falls on the inland desert plains.

Bands of small people called *Bushmen* live in the Kalahari desert wherever there are tufts of grass upon which antelopes may feed. The Bushmen have no gardens but live by hunting the antelopes. These small savages belong to the Negro race.

The main sources of the Orange river system are in the eastern coast ranges of southern Africa. The greater part of the Orange basin is very dry. Even the main river is too shallow for steamers, and many of the branches flow only during the wet season. There is good pasturage in the eastern part of the basin, but the middle and western parts are little more than a desert.



The southern part of Africa, including nearly all the region south of the Orange river and a small area north of it, is known as *Cape of Good Hope*. It is crossed from east to west by a rugged plateau that forms the southern end of the great African highland.

The seaward slopes of this plateau, like those of the Atlas highland, have winter rainfall and summer drouth. During the wet months, when the westerly winds prevail, the short streams swell to torrents, but in the dry season they dwindle away.

Wheat and other grains thrive on the seaward slopes of Cape of Good Hope, and many cattle, sheep and ostriches are reared there. Wool, ostrich feathers and hides are valuable exports.

The richest diamond mines in the world are at Kimberley. The value of the diamonds is greater than that of all the other exports of Cape of Good Hope.

The native people of this country belong to the Negro race, but white people from the British Isles control the land and form about one fourth of the population. Cape Town is the chief port in southern Africa.

Near Cape Town rises a huge flat-topped rock called *Table mountain*. Southward from this rocky mass extends a small peninsula ending in the well-known cape of Good Hope.

Madagascar, the largest island off the coast of Africa, is about two and one half times as large as Great Britain. Its coastal region is mostly low and unhealthful, but the interior consists largely of grassy or wooded plateaus.

The leading exports are hides and India rubber.

93. Australia.[1]

Australia, the smallest of the continents, is about equal in area to the United States, not including Alaska.

This small continent consists mainly of a half-circle of low plateaus and ranges, around a wide central desert plain. Except in the southeast, the ranges are little more than hills. The Australian Alps are about equal in height to the ranges of the Appalachian highland.

The Pacific slope of Australia is in the path of the trade winds. The seaward slopes of the Australian Alps and the Blue mountains[2] are therefore well watered. After crossing the mountains, these winds can give very little moisture to the basin of the Murray river. The streams of this basin are fed chiefly by rains in the highland on the southeast.

In what season do the equatorial rains reach northern Australia? *See maps on page 24.* What winds carry rains to the southern coast? What other continents receive rains from the same belt of winds?

When the equatorial rains of the southern summer occur in the campos of Brazil and in the Kongo basin, they reach the northern part of Australia also. In that season the drying southerly winds, moving towards the heat equator, pass over the plain of middle Australia. During the southern winter, the winds blow outward from this continent and therefore yield little rain. Thus the middle plain is almost rainless.

The basin of the Murray river is thought to be about one third as large as that of the Mississippi. The Murray river and its branches form the only large river system in Australia, and yet even the main stream of this system is not deep enough to float large sea-going vessels. After heavy rainfall in the mountains, small vessels can ascend the Murray and some of its branches; but in seasons of drouth the rivers become too shallow for shipping, and some of them are little more than chains of ponds or shallow pools.

Inland Australia has a number of large lakes with no outlet to the sea. These lakes are fed by long shallow streams from the border ranges. During the dry seasons, many of the lakes dwindle away to salt marshes.

Most of the Australian trees are evergreens. Some of them shed their bark instead of their leaves, and many turn the edges of their leaves to the sun.

The giant *eucalyptus* trees are of this kind. They grow to a great height. Several species of Australian eucalyptus trees are now common in California.

The largest forests in Australia are in the eastern highland region, where the rainfall is heaviest. Wide areas of the inland plain are covered with coarse scrubby bushes.

The wild animals of this continent differ widely from those in the other continents. None of the kinds of large animals in the other continents which we have studied are native to Australia.

Just east of Java are two small islands named *Bali* and *Lombok*. They are separated by a narrow strait that forms part of a deep-water line known as *Wallace's line*. It runs northeast past Celebes and divides the islands of the East Indies into two groups whose animals differ widely. Those on the side of the line nearest Asia resemble the animals of that continent, while those on the other side of the line resemble the animals of Australia. For this reason, it is believed that some of the islands were at one time joined to Asia, and the others to Australia. This is the line of deep water referred to on page 73. *See map on page 111.*

Australia has many animals with pouches, or folds of skin, on the under sides of their bodies. Some animals carry their eggs in these pouches. Others carry their helpless young, till they are strong enough to take care of themselves.

[1] The Map Studies on page 97 are to precede this lesson.

[2] The Katoomba falls are in the Blue mountains.

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RELIEF MAP OF AUSTRALIA.

The kangaroo is the best known of the pouched animals. It often grows to the size of a man. This animal has very strong hind legs and moves swiftly by leaping. Kangaroo skin is tanned and thus made into leather. This is used in the manufacture of shoes, satchels and other articles.

Lesson 117 describes some of the other curious animals of Australia.

Samoan Princess.

The natives of Australia belong to the black race. They are savages and live wretched lives. The total number in all the tribes is only about thirty thousand.

The fertile portions of the continent are inhabited by white people, mostly from the British Isles. The white men have driven the savages from these fertile lands. The population of Australia is only about one twentieth as great as that of our own country.

Neither sheep, cattle, wheat nor corn are native to Australia, yet they now form the chief sources of wealth there. The continent is famous for its gold mines, — mostly situated in the hilly belt along the Pacific margin.

94. Map Studies.

Describe Australia, — its size, its place among the oceans, its direction from the other continents, its position in the heat and wind belts, its highlands and lowlands, its rivers, its coastline.

In what respect is Australia like Africa? In what respect does Australia differ from North America? Locate New Guinea; Tasmania; New Zealand; the Fiji and Samoa islands.

95. New Zealand and Other Islands.

A little more than a thousand miles southeast of Australia lie two large islands and several small ones forming the group known as *New Zealand.*

The mountains of southern New Zealand, rivaling in height the Rocky mountains, receive heavy rainfall from the westerly winds. Great glaciers descend the slopes of the New Zealand mountains.

Many parts of these islands are forest-clad. Among the trees are lofty pines and large tree-ferns.

The natives of New Zealand belong to the brown race. Their number is small compared with that of the white people who have in recent years chosen those islands for their home.

Cocoanut Tree.

Cocoanuts.

Sheep-raising is the chief industry in New Zealand, although there were no sheep on the islands when the white men first settled there.

Fiji Warrior.

The island of New Guinea is about three and one half times as large as Great Britain. Except along some parts of the coast, New Guinea is in the possession of black people who do very little to develop its resources, although the lowlands of the island are fertile.

Coral and Volcanic islands. Cocoanuts, breadfruit, fish and turtles are almost the only food of the natives on most of the small Pacific islands.

Many of the low islands in the Pacific are of coral origin. Some are in the form of long bars, or *reefs;* others take the shape of rings, or *atolls,* inclosing lagoons.

The higher islands far out in the Pacific are volcanoes. Many of these

are still active, but others are extinct. Coral reefs, called *barrier reefs*, surround most of the lofty islands.

There are about 300 islands in the *Fiji group*, but only two of these are of fair size. The most important is Viti-Levu. These islands are chiefly of volcanic origin. They are rugged and mountainous.

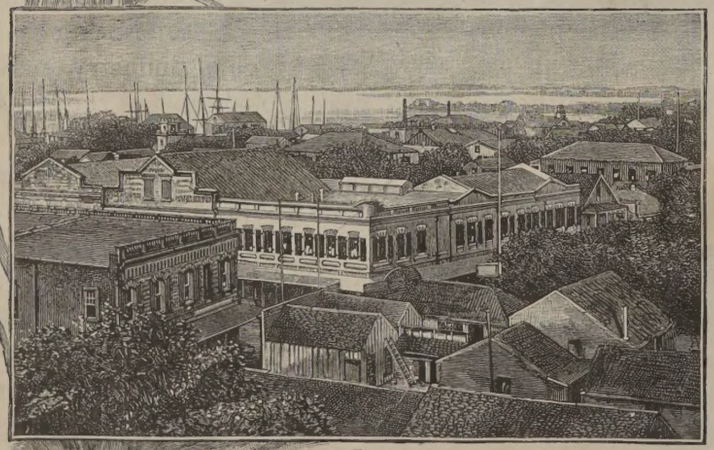
Before white men settled on some of the islands, the Fijians were cannibals, as were also many other groups of Pacific, or "South Sea," islanders. The custom of eating human flesh has not wholly disappeared from all the islands.

The Fijians have strong and well-built bodies, as shown in the picture on page 97. As a race, they are fierce and warlike.

Southeast of the Fiji group are the *Tonga islands*, of which Tonga is the largest. Since white people first went to these islands to teach the natives, most of them have learned to read.

The *Samoa islands* are northeast of the Fiji group. *Apia* is the chief town. The Samoans are very skillful in using canoes, and for this reason their islands are often called the *Navigator's islands*.

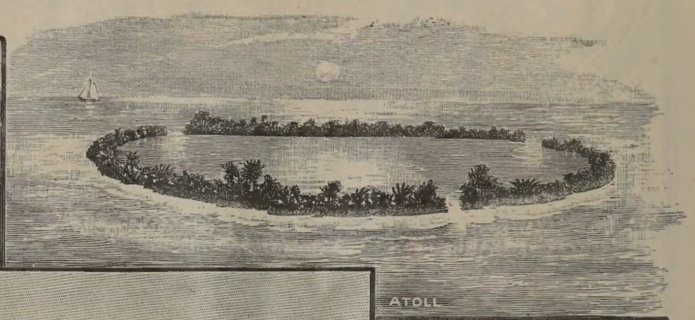
Northeast from New Guinea are several groups of islands which together take the name of *Micronesia*, meaning *small islands*. Among these groups, the Ladrones are mostly of volcanic origin; but the Caroline, Marshall and Gilbert islands are chiefly the work of coral polyps.

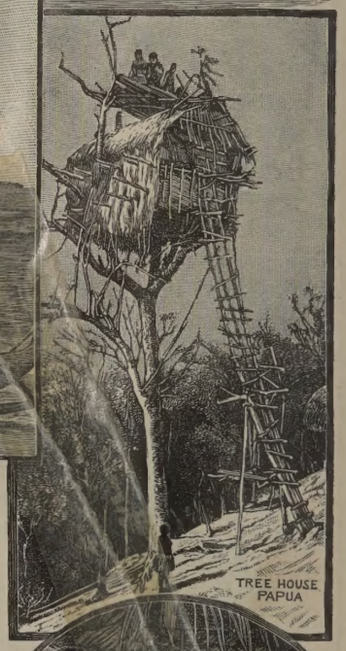


Honolulu, Hawaiian Islands.

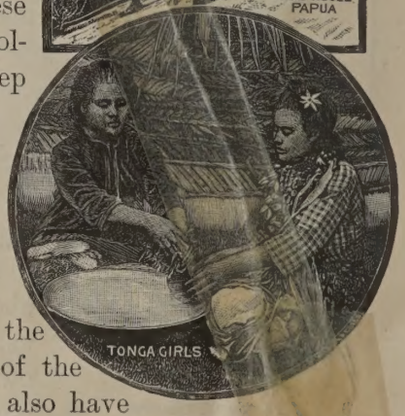
The savages who dwell in these islands may be grouped with the people of the brown race; but in language and customs, the Micronesians differ from the natives of the large islands of the East Indies.

The natives of the Marshall islands are very skillful in sailing canoes. These islanders often take voyages lasting several months. They carry provisions, but depend on rain for drink. Perhaps the lonely islands far out in the Pacific were in many instances first peopled by castaways who while out in their boats were driven from their homes by winds and ocean currents.





The *Hawaiian islands* are near the tropic of Cancer about 2000 miles southwestward from San Francisco. These islands were built up by volcanic action, from the deep bottom of the middle Pacific. They form the most important group among the many islands which rise far out in that ocean.



The natives of the Hawaiian islands belong to the brown race. Many people of the white and the yellow races also have settled there. A few years ago the white people took charge of the affairs of the islands. In 1898 they were annexed to the United States. *See Supplement.*

The lowlands of the islands are fertile. Among the products are sugar cane and rice. Nearly all the Hawaiian foreign trade is with the United States. In exchange for sugar, our country sends provisions and clothing.

Hawaii is the largest of the group of eight islands. Honolulu, the chief city, is on the island of Oahu. This city is reached by steamships from San Francisco.

The Kilauea crater, in the Hawaiian islands, is not very high, but it is the largest active crater known. The floor of this crater is a lake of hot lava which at times rises above the rim and runs off in great streams. The Mauna Loa crater, near that of Kilauea, pours forth more lava than any other volcano yet found.

RACES OF MEN.

96. Homes of the Races.

We have seen that the people in various parts of the earth do not all look alike, do not eat the same kinds of food, do not wear the same style of clothing, nor live in the same kinds of houses.

Near the Kongo river there are black savages living in straw huts, with no books, no lamps, no rifles.

The people of the earth are divided into five groups, or *races*. The people of one race differ from those of the other races in color, in size, in the shapes of their skulls, in kinds of hair, in language, and in other respects.

In some places we shall find that people of two or more races live side by side, but certain lands are known as the home of each race. Thus, America is the home of the Indian, or red-brown race. Most of the brown people are found on islands southeast of Asia. The north and east slopes from the Asian highland are the home of the yellow race.

The Indians in the selvas spend their time in fishing and hunting. They wear but little clothing and use blowguns and bows and arrows.

On the islands southeast of Asia, brown people live in bamboo huts, and raise rice, coffee and spices. There the boys make baskets, and the girls weave cloth.

We have read about the Chinese with their long braided hair and their slanting eyes. We have learned that they weave fine silk and pack boxes of tea.

We know that white people live in our own country and in many other countries. We have seen their books, railroads, ships, workshops and homes, or pictures of them.

The home of each race is bounded on nearly all sides by oceans, deserts or lofty highlands. The desert of Sahara lies between lands of the black and the white races. The Himalaya mountains separate homes of yellow and of white people. The land of the Indian is bounded on all sides by the sea.

No race is now limited to its original home, for the people of each race have spread more or less into the lands of other races. Thus, white people are now found in nearly all settled parts of the earth.

There are about 1,500,000,000 people in the world.

97. The Negro or Black Race.

In what part of Africa do people of the black race live? *See map on page 102.* What large river basins are in this region? What desert is on the north? What oceans are on the east and west?

The natives of middle and southern Africa vary in color from black to brown. Most of them have broad flat noses, thick lips and black frizzly hair.

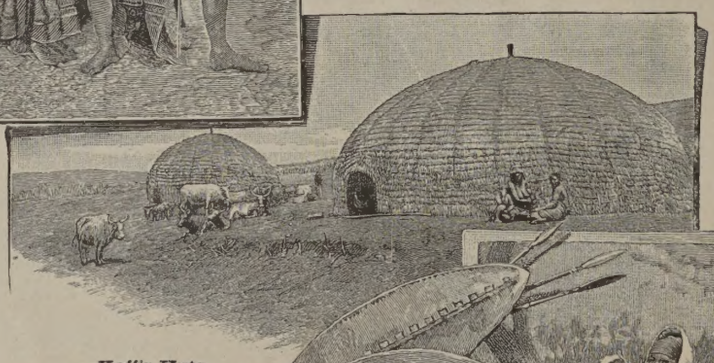
The true Negroes are found in nearly all parts of Sudan, but the people in the tribes southward from Sudan to the cape of Good Hope also belong to the Negro race.

Negress.

Australians.

Negro Children at the Paris Exposition.

Most of the tribes living south of Sudan form a large branch of the black race, known as the Bantu people. Their language does not resemble that of the Negroes of Sudan, but no other marked difference has yet been discovered.



Kaffir Huts.

The Kaffirs of southern Africa belong to the Bantu branch of the Negro race. One of the pictures on this page shows a common form of Kaffir hut.

The Negroes in some parts of Africa build houses, weave coarse cloth, and make spears, bows and shields. Many of the black people raise cattle, and plant grain. If the long rivers of Africa were open to ships from the sea, the savages might more easily learn how the white man dresses, prepares food, tills the soil, uses books, and defends himself.

Kaffir Boy.

Sudanese Woman.

Millions of black people have been taken from their homes in Africa and sold as slaves, but the slave trade has now been almost stopped. The climate of their native land fitted the Negroes to work in the low and hot regions of the earth. Many of the people of Brazil, the West Indies and the southern plains of our own country are free descendants of African slaves.

The black natives of Australia are classed with the Negro race. Their color is dusky brown, and their hair is curly.

The number of Australians is small, compared with the number of white people who now live in that continent. There are only about thirty thousand in all the tribes. These are thinly scattered around the continent, chiefly within about two hundred miles of the coast. The Australians are savages of very low grade. They wear but little clothing, and tattoo the skin.

One of the native weapons is the *boomerang*. This is a curved stick which may be thrown in such a way that it will return to the thrower. Wooden spears and stone hatchets also are used.

The savages of Papua, or New Guinea, belong to the black race.

We know very little about the Papuans. They paint their bodies and go about almost naked. The tribes of the inner part of the island are said to be very fierce.

Kaffir Girl.

The number of people in the black race is about 150,000,000,— one tenth of the people on the earth.

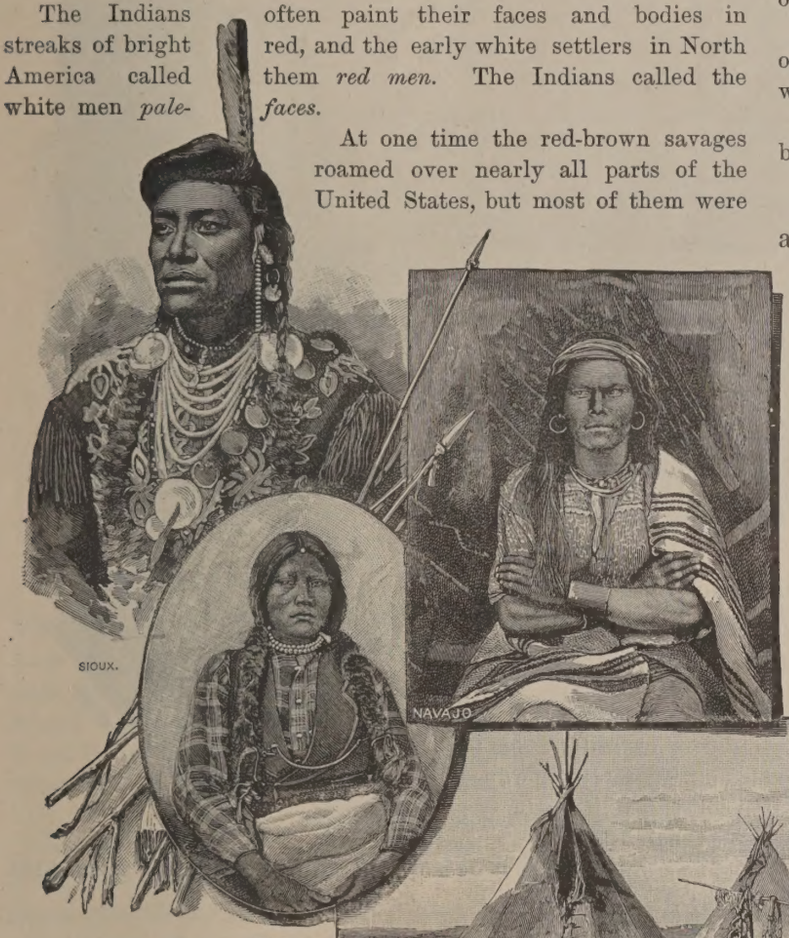
98. The American or Red Race.

This group is made up of Indians,—the native tribes of America.

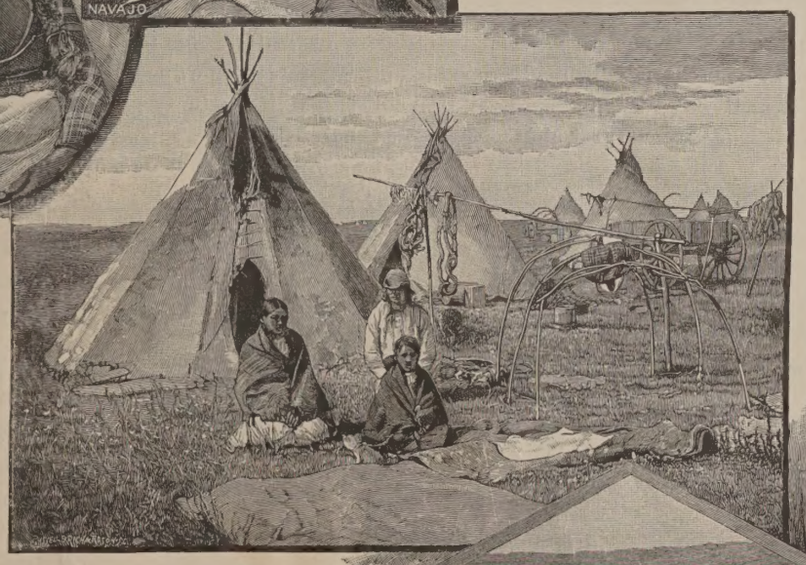
Most of the Indians have high cheek-bones and straight black hair. Their skin is reddish-brown or copper color.

The Indians often paint their faces and bodies in streaks of bright red, and the early white settlers in North America called them *red men*. The Indians called the white men *pale-faces*.

At one time the red-brown savages roamed over nearly all parts of the United States, but most of them were in the eastern half of the country, where game was abundant and where corn could easily be raised. The women planted gardens of corn, and the men spent their time hunting deer, bison and other animals.



Indian Types.



Indian Camp.

The Indian taught the early white settler how to make soft shoes of deer-skin, and canoes of birch bark. From the savage the white man learned also how to make Indian corn grow in a forest. Rings of bark were cut from the trunks of the trees, or the bark was burned off, so that the sap could not flow. The trees soon died, and the corn could then ripen in the hot sunshine.

It is thought that about 250,000 Indians lived in this country when the first white settlers came to its shores. The number now remains about the same, with perhaps a slight increase.

Nearly all the Indians in the United States are now upon *reservations*. These are large tracts of land set apart as homes for the tribes. Only a few small tribes dwell east of the Mississippi river. The most thrifty tribes are now living in Oklahoma. *See colored map of the United States.*

About one third of the Indians in our country live in good houses of wood or of brick. They own large herds of cattle, and raise grain and fruit. In some places they have good schools.

Some tribes still live in tents. Others build *pueblos*, — houses or villages made of sun-dried bricks or of stone.

The native weapons are the bow and arrow and the tomahawk, or hatchet. The Indians shoot the arrow and throw the tomahawk with great skill. Many are now skillful with rifles.

The Indians had no horses before the Europeans came to America, but most of the savages are now excellent riders.

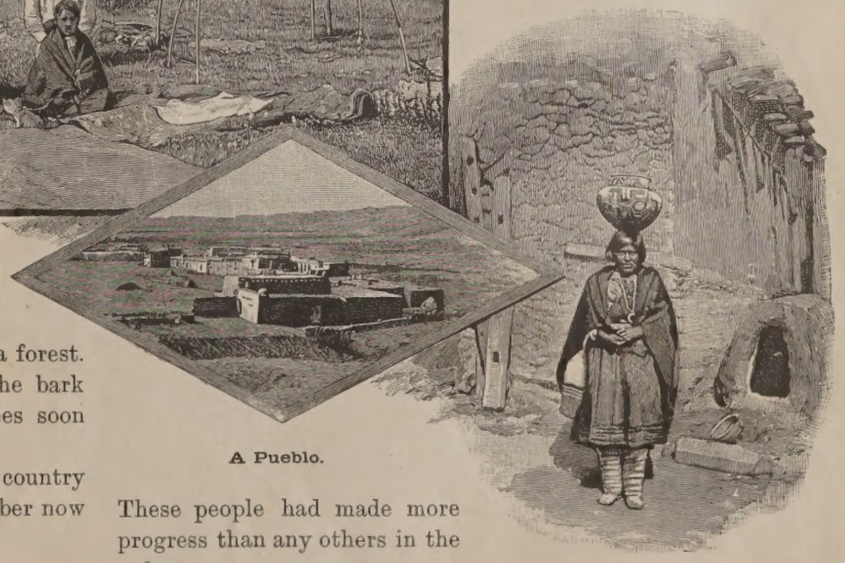
Millions of Indians live in Mexico, Central America and South America. Some of these are still savages, but many have mingled with people of the white race and have given up most of their savage customs.

In Mexico alone there are nearly 5,000,000 Indians, while as many more people in that country are part Indian and part white. Not one fifth of the inhabitants of Mexico are pure white.

In all the countries of South America the races are greatly mixed. Most of the white people live near the coasts, but there, as well as farther inland, are found several million Indians and thousands of Negroes. The latter are mostly descendants of freed slaves.

The Indians of the interior of South America are savages of low grade and will doubtless remain so until that region is settled by white people. The Indians of the selvas are scattered in many small tribes.

When the first white settlers came to America, the Indians of Peru and Mexico had temples and other buildings of stone. They made cloth and worked in copper and gold, but the use of iron was not known to them. They built good roads and bridges.



A Pueblo.

A Zuni Water Carrier.

These people had made more progress than any others in the red race.

The American or red race includes only about one twelfth as many people as the black race. Most of the Indians live in the torrid zone.

Fiji Islanders.

Fiji Hut.

Malay Hut.

99. The Malay or Brown Race.

In what part of the world is the brown race found? Name three large islands peopled by this race. What are some of the products of these islands?

What great island east of Africa is settled in part by people of the brown race?

The people of the brown race have coarse black hair, flat faces and short skulls. Many of them have strong and well-built bodies.

The brown people live mostly on islands, but their home includes also the Malay peninsula. Borneo, Sumatra, Madagascar and Java are the most important islands peopled by the brown race, but the region includes countless islands that extend for thousands of miles out into the Pacific.

Many people of the Malay race are yet savages. Others are traders or sailors. Many thousand people of this race inhabit the northern part of New Zealand. These are known as *Maoris*. They are brave and warlike, and have fought hard to prevent the white man from seizing their island home, but they have lost their largest and best parts of their islands.

The brown people raise a very large portion of the spices used in the whole world.

Map of the Races.

The brown or Malay race includes only about one fourth as many people as the black race.

Reference Tables.

Note: The statistics given below are to a very large extent mere estimates, not based on census returns. These tables are placed here for reference and not for memorizing.

Total Population of the World	1,500,000,000
Caucasian	690,000,000
Mongolian	600,000,000
Negro	150,000,000
Malay	35,000,000
American	12,000,000
Mixed Races	13,000,000
Christians	400,000,000
Buddhists	500,000,000
Mohammedans	200,000,000
Brahmanists	150,000,000
Jews	8,000,000
Pagans and others	242,000,000

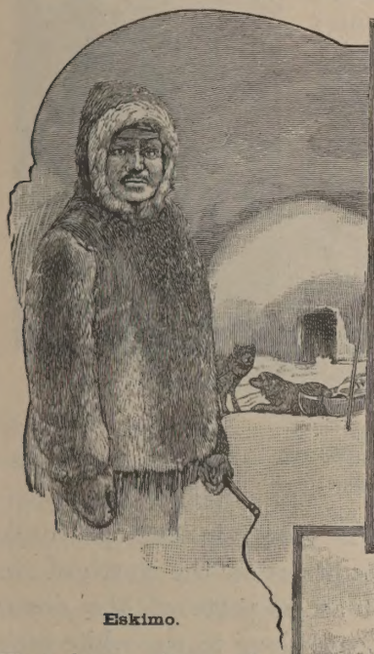
100. The Mongolian or Yellow Race.

Where is the home of the yellow race?

Where is China? Japan? Siam? Anam? Siberia? *See colored map of Asia.*

What great river basins of Asia slope to the Arctic ocean?

The Japanese and the Chinese are famous for the weaving of silk and the making of porcelain. They have not yet learned the great value of coal, although there are coal beds in their countries. These people know very little about machinery for weaving cloth or for making iron and steel goods. In the great empire of China there are only a few miles of railroad.



Eskimo.

Japanese.

What large rivers of Asia flow into border seas along the Pacific coast? What race is found in most parts of these basins?

Japanese Temple.

River Scene, Japan.

Many tribes of yellow people are found on the long Arctic slope of Eurasia.

Some of these live by fishing and hunting. Others keep herds of reindeer. These useful animals supply the people with food and clothing.

Many white people from Russia, in Europe, have moved eastward across Siberia and now far outnumber the yellow people in that land.

The Lapps and Finns of northwest Europe belong to the yellow race.

The people of the yellow and the brown races resemble one another. Most of them have coarse black hair, flat faces and short skulls.

The races differ slightly in color, in the slant of their eyes and in some other respects. The brown race is perhaps a branch of the yellow race. The American Indians also resemble somewhat the people of these two groups.

Japanese Raincoats.

Woman of Burma.

Chinese.

Small tribes of yellow people, called *Eskimos*, live along the Arctic shores of America.

There the summer is too short to ripen grain. Seals, deer, bears, fish, walruses and sea fowl supply food, clothing, heat and light.

Most of the Eskimos live in rounded huts made of stones, skins or driftwood, and wear clothing made of the skins of seals, bears and birds. Hunting parties often make huts out of blocks of snow. In winter all the huts are buried in snow.

The yellow race is found in nearly all parts of Asia, on the north and east of the great central highland. The home of this race reaches from the Himalaya mountains to the Arctic coast, and also includes every river basin sloping to the Pacific coast of Asia.

Several centuries ago, the Chinese invented printing and gunpowder, but for many years that nation has made little progress. The Japanese have made more progress than any other people of the yellow race. They have good schools, and have been wise enough to adopt many of the customs of the leading white nations.

The yellow race includes more than one third of the people on the earth. About one fourth of the human race is found in China.

101. The Caucasian or White Race.

What race lives in Africa north of the desert of Sahara? What race occupies the greater part of Europe?

Between what races do the Himalaya mountains rise?

Where have white people settled in North America? In South America? In Africa? In Australia?

The home of the white race in the Old World lies between the lands of the black and the yellow races. It reaches from the desert of Sahara to the Arctic shore, and includes also the part of Asia lying south and west of Tibet. It is thought by many persons that ages ago there lived in central Asia a race of people now called *Aryans*. Large bands of these people roamed about in search of new homes.

Many of the Aryans, with droves of cattle, went into India.

Scotch Piper.

Many tribes of Aryans fought their way across *Low Europe*. These have grown to the leading nations of the world. They include the English, Irish, Scotch, Welsh, Germans, Scandinavians, Russians and others, and most of the white people in our country,

Belgians.

Rhine Women.

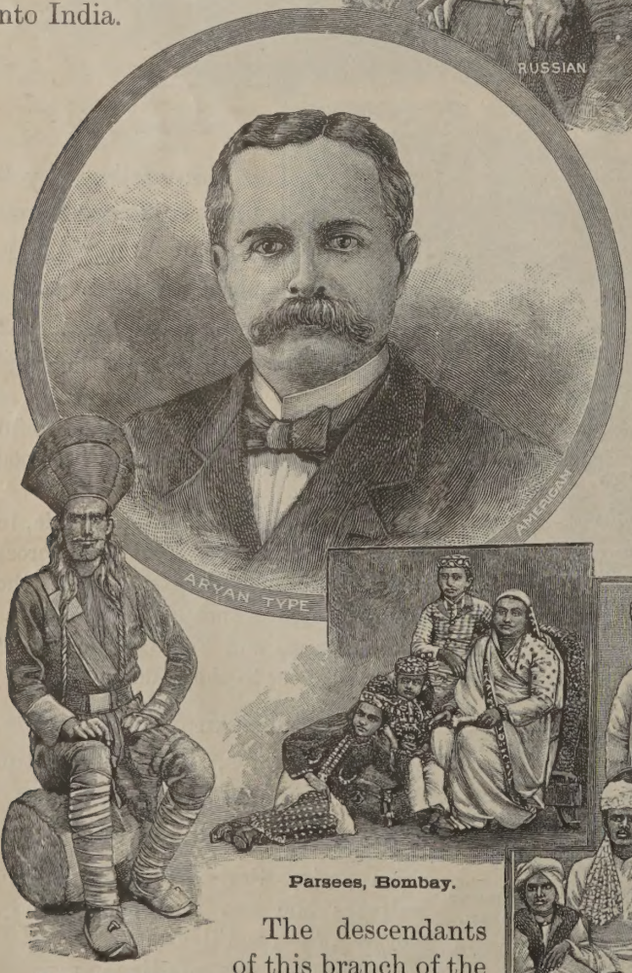
Canada, southern Africa and Australia. The people in the peninsula of Arabia and in the countries on the north of the Sahara desert, as well as in parts of the desert itself, are very dark, but most of them belong to the white race, though not to the Aryan branch. These are called *Semites*.

The Semites gave us our alphabet and system of Arabic figures. The Jewish people belong to the Semitic branch, but they are now scattered throughout the leading countries of the world.

Many of the tribes in the Sahara desert and along its eastern and southern borders form a still darker branch of the white race, called *Hamites*.

The Hamites differ from the black race in having thin lips, narrow noses and straight or curly hair. There are many Hamites in Sudan. They have for ages mingled with the Negroes of that land, and the races have become greatly mixed.

The white race outnumbers even the yellow race. These two great races together include all but about one seventh of the people in the world. There are nearly 700,000,000 people in the Caucasian race.



Kashmir Soldier.

Parsees, Bombay.

Hindus.

Ceylon Girl.

Mexicans.

The descendants of this branch of the Aryans are now called Hindus. Their country is one of the most thickly settled in the world. Other bands drove their herds westward, and settled in the grazing lands of Persia. *See the map of Asia.* After many years, one branch of these people moved along the northern shore of the Mediterranean sea. The tribes of this branch have grown to great nations in Greece, Italy, Spain, Portugal and France.

102. Religions.

People who worship idols, or objects such as the sun, fire, animals or images, are called *pagans*. As a rule, they believe that there are spirits having magical power to do good or evil.

Woman of Jerusalem.

Nearly all savages are pagans. Most of them belong to the black and the red races, but there are many savages in each of the other races. About one seventh of the people on the earth are pagans.

Egyptian Runner.

Egyptian Woman.

India is the seat of a very old religion that divides its followers into classes called *castes*. The four principal castes are the priests, the soldiers and rulers, the merchants, the servants. Below these are the outcasts.

Brahma is one of the chief gods in this religion. The priests are called Brahmans, and all the believers are *Brahmanists*.

About one half of the people in India, or one tenth of mankind, are Brahmanists.

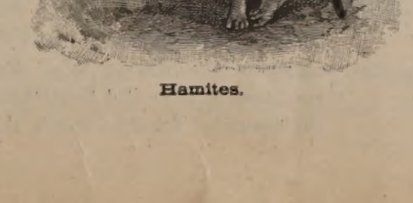
Many centuries ago a prince in India taught that caste had nothing to do with religion. He did not believe in a God. This prince was called *Buddha*, and his followers are *Buddhists*. The Buddhist religion in India soon passed away, but it spread over central and eastern Asia.

Most of the people of the yellow race, or about one third of the human race, are Buddhists.

The Semitic branch of the white race has given to the world the three religions whose followers worship one God.

The Christians believe in one God and the *Bible;* the Jewish people believe in one God but not in the *New Testament;* the Mohammedans believe in one God, but their sacred book is the *Koran*.

The Christians are mostly descendants of the Aryans who settled in Europe. The Christian lands include the greater part of America, Europe and Australia, and the many European settlements in nearly all parts of the world. About one fourth of the people on the earth are in Christian countries.



Hamites.

Mohammed, the founder of the religion which bears his name, lived in Arabia about a thousand years before the first English colony settled in America.

The Mohammedan religion has spread into northern Africa and Sudan; also, over nearly all southwest Asia, part of India, and the largest of the islands settled by the brown people. This religion includes among its followers about one seventh of the human race.

Arab Woman.

A body of people above the savage state, united under one ruler, may be called a *nation*. The land inhabited by a nation is known as a *country*. The city in which the laws of a nation are made is the *capital* of the country.

103. Governments.

A number of savages living under one ruler, or *chief*, form a *tribe*. A chief generally has absolute power over the lives and property of his subjects, but as the tribes become more civilized the people secure more rights.

The *tribal* government is the common form of rule among pagans.

Semitic Type (Arab).

Moorish Woman.

Among some nations the rulers have absolute power. They make the laws and enforce them, and also hold office for life by right of birth. A nation thus ruled is an *absolute monarchy*. The rulers, or *monarchs*, take such names as *czar, shah, sultan, ameer*.

The Mohammedan and Buddhist nations, except Japan and Persia, are absolute monarchies.

A government in which the ruler holds office by right of birth, but is limited in power, is called a *limited monarchy*. Such a ruler is commonly called a *king, queen, emperor* or *empress*.

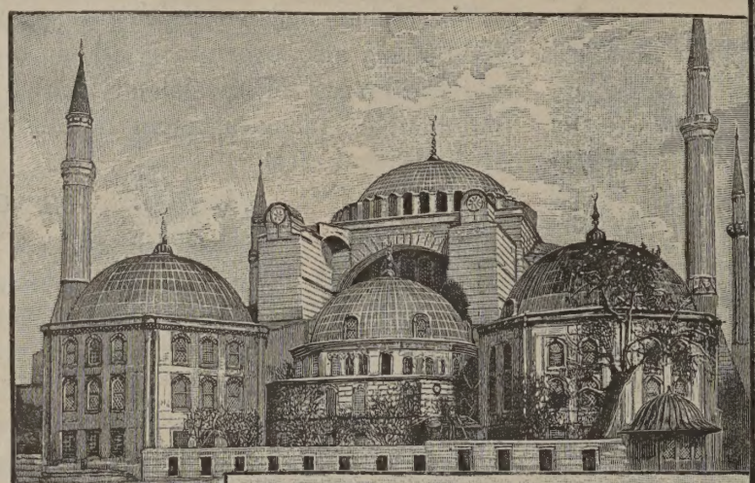
A government in which the people elect their own ruler is a *republic*.

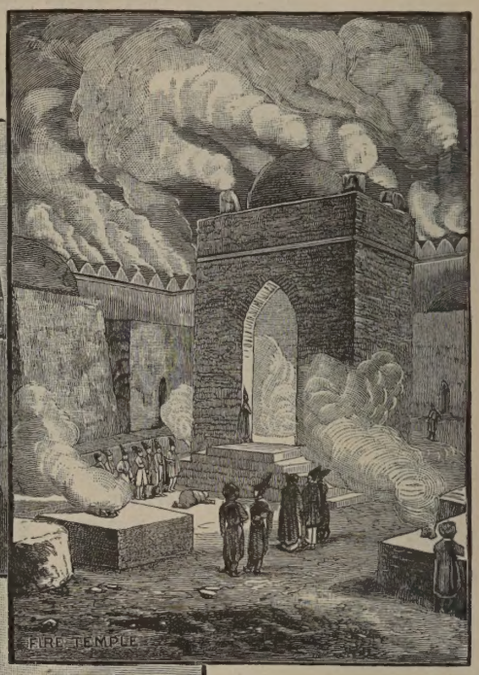
The Christian nations, except Russia, are either limited monarchies or republics. Russia and Turkey[1] are absolute monarchies. France and Switzerland are republics.[2] The other nations of Europe are limited monarchies.

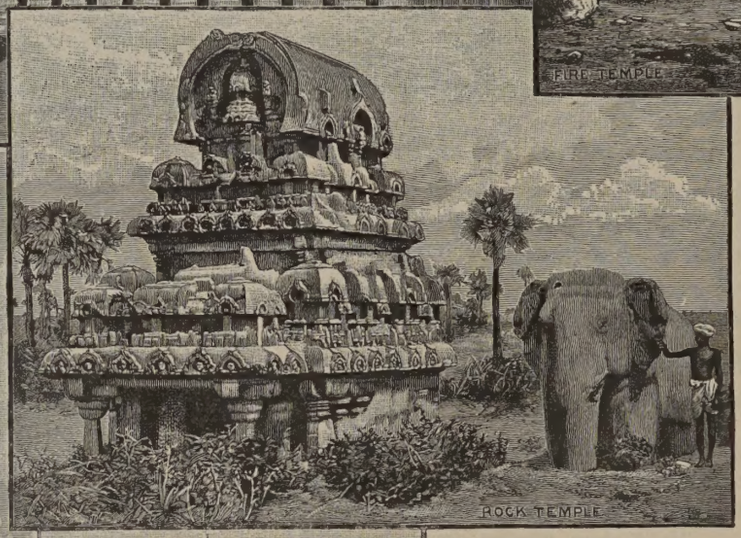
The nations in Europe have laid claim to nearly all parts of Africa, as well as to some other lands. Great Britain possesses Canada, Australia, India, Belize,[3] and part of Guiana. The other two parts of Guiana belong to France and Holland.

Greenland and Iceland belong to Denmark. The nations in Europe govern several other islands off the coast of America. Cuba has won its independence and is a republic.

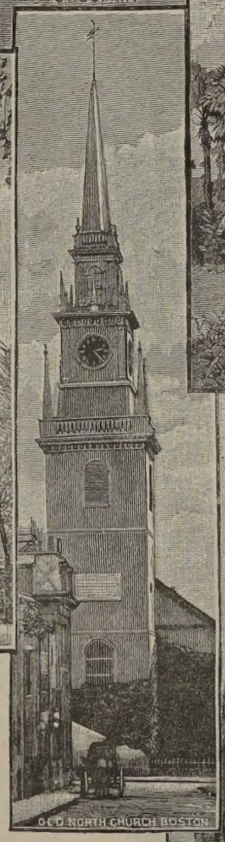
All the countries in America are republics, except those named above as possessions of nations in Europe.[4]

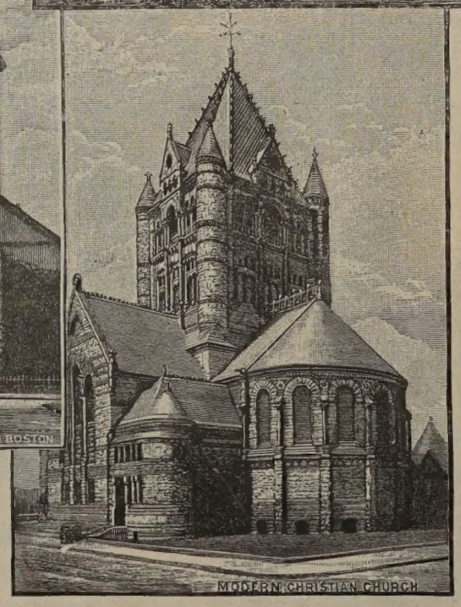

MOSQUE OF ST. SOPHIA


FIRE TEMPLE


ROCK TEMPLE

PAGODA


O. C. NORTH CHURCH BOSTON


MODERN CHRISTIAN CHURCH

104.

Review of the Races.

What races are separated by the Pacific ocean? By the Atlantic ocean? By the Indian ocean? By the desert of Sahara? By the Himalaya mountains?

What bounds the land of the Negro on the north? Where are the Bantu tribes? The Kaffirs?

Where do the Papuans live? In what part of Australia are black natives found? In what part of the United States are there many Negroes?

Where is the home of the brown race?

Name three large islands of the East Indies.

Where are Indians found? Eskimos? Lapps? Japanese? Chinese?

Where is the home of the white race in the Old World? Who were the Aryans? Where are the Hindus found? The Arabs? The Egyptians?

Tell what race or races are found in each of these river basins: Amazon, Kongo, Mississippi, Nile, Ganges, Lena, Niger, Plata, Mackenzie, St. Lawrence, Volga, Yangtze, Amur.

What people live on the highest plateau? In the largest river valley? On the greatest desert? In the coldest lands?

What races live along the shores of the Pacific ocean? Of the Indian ocean?

To which race or races do the people in each of these lands belong? — China, British Isles, Brazil, Arabia, Germany, United States, India, Greenland, Borneo, Russia, Japan, Kongo State, Egypt, Peru, Mexico, Sudan, Java, Australia.

PICTURES. — The "Mosque of St. Sophia" is a Mohammedan place of worship in Constantinople. The "Fire Temple" is supplied with gas from the naphtha wells of Baku, a port on the west coast of the Caspian sea. The "Rock Temple" is a fine specimen of the Hindu temples in India. Pagodas are common in southeast Asia. Paul Revere's signal lanterns were hung in the tower of the "Old North Church." The lowest picture in the group is the beautiful Trinity Church, Boston.

[1] Turkey is under the rule of Mahommedans, but most of the people of European Turkey are Christians. Japan is a limited monarchy.

[2] San Marino and Andorra are scarcely more than small cities. *See pages 77 and 79.*

[3] A colony in Central America.

[4] For fuller account of our government, see lesson 125.

PLANTS.

105. Where Plants Grow.

Can you name two plants that thrive in wet soil? Two that thrive in sandy soil?

Where do water lilies grow? Do you know where pussy willows are found?

Of what use are long roots to trees? Would short roots be as useful? Try to find a plant growing on the bark of some tree. Name two trees that drop their leaves in autumn. Name two that hold their leaves all winter.

In what ways may seeds be scattered over level land? How may they be carried over high land? Across rivers?

Name two plants that yield fibers from which cloth is made. Name three plants that are used in making medicine.

What is tar? What is India rubber? Name six food-plants. What articles are made from sap? From buds? From leaves? From seeds? From bark? From roots?

106. Soil, Water and Heat.

Plants cannot live in every place where their seeds may fall, but only where the soil, heat and moisture are suited to their growth.

Meadow grass thrives in rich moist soil. Thistles often spring up in sandy and rocky places. Water lilies take root in mud at the bottoms of ponds. Mosses cling to rocks and trees. Clover seeks warm sunlight. Many ferns grow in shady woods.

Seeds of swamp plants may be blown to dry sandy fields, but there they will die. If thistle seeds are sown in a swamp they will rot. Some kinds of rice grow in flooded fields, while many cactus plants thrive in deserts.

Some plants need a longer hot season than others in order to ripen their seeds.

Orange blossoms often cover a tree in early spring while the branches are still loaded with golden fruit from the last year's blossoms. The apple tree blooms in the spring-time, and its fruit ripens before winter.

Bananas require hot or warm weather all the year; while in the far north, where snow covers the ground except for a few weeks in summer, millions of poppies find time to spring up, blossom, and ripen their seed.

A plant is not found in all places where the soil, heat and moisture are suited to its growth. If the plant is not native to the place, its seeds or the plant itself must first be taken there.

When white people first settled in America they found here no wheat nor cotton. After a time the seeds were brought across the ocean, and now these plants are among the most valuable in the New World. Most of our grains and fruits are natives of other lands

107. Plants of the Hot Belt.

What lands are included in this belt? *See map on page 18.*

What are the seasons in this belt? When do the rainy seasons come? *See page 24.*

The torrid belt is often called the *belt of palms*, because so many palm trees thrive in it. Among these is the useful cocoa palm.

From the wood of its trunk many useful articles are made. The fibers of the leaves are woven into ropes, cloth, mats and baskets.

The natives use the nuts for food, and make dishes out of the hard shells. The cocoa palm thrives best near the sea.

Some palm trees produce dates. These are the chief article of food of many desert tribes. Other palms yield wax, oil, sago and wine.

India rubber is made from the sap of many kinds of trees and vines that grow in the hot belt. Many dye-woods are also found there. Among the trees of the hot belt yielding valuable wood are ebony, rosewood and mahogany.

Another useful product of the hot belt is bamboo. This is a very strong coarse grass-like plant, growing to the height of sixty or seventy feet.

In India, China and the East Indies entire huts with their furniture are made of bamboo. Its seeds and tender shoots are served as food, on dishes cut from its tough joints. Other parts of this plant are used in making baskets, paper, ropes, boats, cloth and weapons.

Among the chief articles of food of people in the hot belt are bananas, plantains and breadfruit. Bananas and plantains are very much alike, — the latter being slightly the coarser.

Breadfruit grows to about the size of a child's head. The fruit is often baked, and sometimes it is ground to flour after being baked. On many islands in the Pacific bananas and breadfruit are almost the only food of the natives.

The East Indies and many other parts of the hot belt are very rich in spices. There are found the sweet-scented kernels of nutmeg, the biting flower buds of the clove, the fragrant bark of the cinnamon, the hot root-stock of the ginger, and the stinging dried berries of the pepper.

This belt supplies the world with coffee. Among the other chief products are cotton, sugar cane, rice and the opium poppy.

The vegetation of the hot belt surpasses in variety and density that of any other belt. In places the trees grow in dense masses, with long vines weaving networks among the branches. Many orchids of rich color and beautiful shape grow in the forests. There are also tree ferns, huge lilies and countless other plants which we can see only in hothouses.

The thick foliage shuts out the drying sunshine from the lands in many parts of the hot belt. The rainfall being heavy, these lands become very wet and therefore unhealthful for white people.

108. Plants of the Warm Belts.

What lands are in the northern warm belt? What lands are in the southern warm belt? *See map on page 18.*

What are the seasons in these belts?

The plants of the warm belts resemble those in the hot belt. Most of the trees are evergreens, — that is, they do not shed their leaves in winter. Figs, dates, olives and grapes abound, and large groves of oranges and lemons are a source of wealth in many parts of these belts. Cotton also is one of the leading products.

The most productive cotton regions in the world are the warm plains of the United States, India and Egypt.

The value of this plant is shown by the fact that about one half the people of the earth wear clothing made wholly of cotton, and nearly all the rest of the human race, except some savage tribes, use it in part of their dress.

Most of the cactus plants have leafless stems, with large thorns.

The century plant yields a valuable fiber from which cordage is made.

In many parts of the warm belts, and some parts of the cool belts, there are wet seasons followed by months of drouth. In such regions, the rains or the melted snow of the uplands is often gathered into reservoirs, for use during the dry season. Canals or ditches from these reservoirs lead the water into groves, vineyards and vegetable gardens. If it were not for this water supply, some of the most fruitful regions of the earth would be little more than deserts for half the year.

In places having seasons of drouth, water is sometimes obtained by sinking or driving pipes into the ground, thus reaching a supply of ground water. Many thousand of these artesian wells feed ditches that lead water to groves and gardens in the warm belts.

For ages rice has been one of the leading food crops in China, Japan, India and other parts of the warm belts.

Rice grows both in lowland and in upland regions. The best rice is raised on flooded lands. One plan is to lay out the fields in little furrows, about fifteen inches apart. In these the seed is sown, and then water is let in. This stands till the seed sprouts, and the water is then drained off. When a joint forms on the stalk, the fields are again flooded, and the grain ripens while standing in water.

Nearly all kinds of grain thrive in parts of the warm belts. Among the other valuable plants are tea, sugar cane, sweet potato and tobacco. Most of the tea comes from southeast Asia. There is also found the teak tree which supplies valuable lumber, and the mulberry upon whose leaves silkworms feed.

Many species of cactuses grow in Mexico and the arid lands in the southwest part of the United States.

109. Plants of the Cool Belts.

What lands are in the southern cool belt?

What large river basins are wholly or in part in the northern cool belt? What highlands in the Old World bound this belt on the south?

What are the seasons in the cool belt?

The cool belts are often called the *belts of grains.* Indian corn, wheat, rye, oats and barley are raised in nearly all parts of these belts.

Among the leading nations, wheat is the grain most widely used for food. The crops that supply the markets of the world are raised chiefly in the prairies and other plains of the cool belts.

Corn is another valuable grain. It was raised by the Indians long before the white man came to this country. Corn is a rapid grower and is wide-spread over the cool belts and the lands still nearer the equator. This grain is better suited to the prairies having hot summers, than to the British Isles with their mild weather lasting nearly all the year.

Rye, oats and barley are hardy grains and thrive in most parts of the cool belts.

Barley is perhaps the most wide-spread of grains. It grows both upon the Arctic shore of Norway and in the valley of the upper Nile, not far from the equator.

Flax and hemp thrive in the cool belts. Next to cotton, flax is the most valuable of the fiber plants.

Linen cloth and thread are made from the silky fibers that form an inner bark round the stalk of flax. Linseed oil is pressed from flaxseed. This oil is largely used in paints.

Hemp is used in making ropes and coarse cloth.

Many hard-wood trees, such as the oak, maple and walnut, grow in the warmer parts of the cool belts. Forests of cone-bearing trees, called evergreens, thrive in the colder parts of these belts, both on plains and highlands. Trees of this kind abound also on the cool mountain sides in the warm and the hot belts.

The pine, spruce, fir, hemlock and cedar supply the most useful soft-wood timber. The giant trees of California belong in this group.

The cone-bearers are of great value. They are very wide-spread; their wood is light and strong; they yield tar, pitch, rosin and turpentine. Try to find out the uses of these products.

Orchard fruits, hay and vegetables thrive in many parts of these belts.

Vegetables are not generally raised on such a large scale as the grains, yet the scattered vegetable crops, taken as a whole, yield large returns.

The raising of vegetables for market is called *market gardening.* The best locations for market gardens are near large cities where the fresh produce meets with ready sale. Try to find out where the vegetables used in your home are raised.

Hay is a very valuable crop in regions where many horses and cattle are raised and where there are long periods of cold or drouth.

Apples, pears, peaches and grapes are wide-spread over these belts.

110. Plants of the Northern Cold Belt.

What lands are in the northern cold belt? What large rivers flow into the Arctic ocean?

What have you learned about the seasons in this belt?

Some kinds of pine, spruce, birch, willow and other hardy trees grow in the warmer parts of the northern cold belt. Northward the trees become fewer and smaller, ending with dwarf birches and willows, only a few inches in height, on the dreary plains near the Arctic shore. There, in the cold marshy *tundras* are also found mosses, lichens and stunted shrubs.

On the northwest coast of Greenland within a few hundred miles of the pole, and also on the tundras, the summer sun melts the winter snow which has buried the land. Little lakes form, and brooks run into the sea. Sap starts in the willow stems, and Arctic hares come from their holes to feed on the bursting buds. The slopes are bright with poppies, saxifrages and other hardy flowering plants. Large patches of ground are then covered with orange and gray lichens.[1]

All these things are seen where only a few weeks before the land was wrapped in the snow and the darkness of the long Arctic winter.

What have you learned about the days and nights within the Arctic circle?

[1] Adapted from Hayes' *Open Polar Sea.*

ANIMALS.

111. Animals,—Their Habits and Uses.

What do cows feed on? Hens? Mice? Cats? Bees? Horses?

What kind of covering has an oyster? A lobster? A bear? An ostrich? A snake? A frog?

Can you name two animals that live both on land and in water?

How does a cat defend itself? A horse? A cow? A bee?

How does a robin move from place to place? A snake? A fish? A frog? A horse?

Name some of the uses of cows,—of horses,—of dogs,—of sheep,—of hens,—of seals.

The Animal Realms.

112. Animals and Their Homes.

Every kind of creature grows to suit its native haunts. By its teeth, feet and other parts of its body, every animal is fitted to seize and devour its proper food.

Ducks take their food largely from ponds and streams. These fowl have webbed feet and can swim easily and swiftly. The oily bodies of ducks grow very wide and are thus well suited to float. Along the inner edges of a duck's bill are many bristles that form a kind of strainer. When the duck swims with her open bill in the water, insects and small plants are caught in this strainer.

The common woodpeckers have strong bills to peck holes in bark where worms and insects live. Each foot of the woodpecker has two toes in front and two curved backwards. These easily cling to the rough surfaces of trees and the birds can climb very quickly.

Every kind of creature has the kind of covering that suits its native home.

Whales that live in polar seas have thick layers of fat, or *blubber*, to keep the icy water from chilling their muscles. Seals are covered with warm fur, robins with light feathers, alpacas with curly wool, lobsters with strong shells. Each kind of covering is suited to certain haunts.

Animals make their homes in or near the places that supply their food.

Moths of many kinds lay eggs on the leaves which will form the food of the larvae when the eggs hatch. Spiders weave webs in places where flies and other insects flit about.

Many birds build their nests in fruit trees. Most woodpeckers make their homes in decaying trees where there are generally many insects. Frogs lay eggs in ponds where their tadpoles can feed.

Among wild animals there is always a struggle for food and for life.

Tigers pounce upon deer and cattle; many birds feed on worms and insects; owls destroy field mice; polar bears catch seals and fish. Each creature may be the prey of some other.

Every animal has some means of defense or escape.

The chamois leaps from crag to crag; the rattlesnake strikes with poison fangs; the deer runs swiftly; the frog dives into water; the ostrich kicks and runs.

Nearly all animals have power to move about and seek new homes. There are places that animals cannot cross. They may be swift and strong, but they cannot live in regions that do not supply their food.

The warm parts of the Old World are the home of the elephant and the giraffe. What prevents these animals from reaching South America? Why cannot cattle cross wide deserts?

Many animals have been taken by man to new homes.

Cattle, sheep, hogs and horses have been shipped from Europe across the ocean, and now thrive in many parts of America. Countless birds have been carried to places far from their native haunts.

Most animals have a much wider range than plants. The former are always free to move from place to place as the seasons change or as periods of drouth come on. The chief barriers to their travel are oceans, deserts and highlands. These features divide the earth into great *realms*, each having some groups of animals that differ from those of the other realms. Many kinds of animals in each realm are also found in other realms, for some can cross places that are barriers to others.

113. South American Realm.

This realm includes South America, Central America and the West Indies. It reaches from the plateau of Mexico to Cape Horn.

Among the animals of the Andes highland are the llama and alpaca.

These are in the same family as the camel, but they have no humps of fat on their backs, nor broad pads on their feet. Each toe of the alpaca and the llama has a thick sole that clings easily to the rough rocks over which these animals climb to find grass.

Alpacas are kept in large flocks by the Indians of Bolivia and of Peru. These animals are covered with fine soft wool.

Llamas were at one time used in great numbers to carry silver ore from the mountain mines to the coast, and to take back food and clothing to the miners. Trains of cars and mules now do most of this work. Llama wool is made into cloth, but this wool is not so fine as that clipped from alpacas.

Two other kinds of animals in South America resemble the llama. One of these, the vicuña, has fine wool and is kept in flocks. The other, called the guanaco, is hunted by Indians on the plains southward from the pampas.

The large running bird known as the *rhea*, or American ostrich, is found in the same region.

Cattle and sheep in great numbers graze on the pampas and the llanos. These animals are not native to this land but were early brought by white settlers from Europe. Hides, wool and beef are leading articles of export from the valleys of the Plata and the Orinoco.

Two large cat-like animals are found in America. The jaguar is the terror of nearly all South America and is sometimes seen as far north as the Rio Grande. Pumas, or panthers, range over the highland from the southern end of the Andes to Canada. The condor, largest of flying birds, may often be seen on the high peaks of the Andes. This bird is so strong that it sometimes kills sheep and deer.

The selvas and the low plateau of Brazil are the home of countless wild animals.

In these regions, Indians hunt the shy tapirs for their skins and meat. These creatures feed on buds, leaves and tender shoots, in the deep forest. Sharp-clawed ant-eaters tear open the ant-hills, thrust in their long sticky tongues, and gather up the little insects for food. Ant-eaters are often victims of long serpents called boas. These serpents have no poison fangs, but they coil around animals and slowly crush them to death.

There are armadillos, with bony armor; shaggy sloths that cling to branches, by means of hooked toes, and feed on leaves and fruit; harmless iguanas, or lizards, four or five feet long, that lay their eggs in the hollow parts of trees; fierce peccaries that resemble small hogs and feed on roots and fallen fruit.

In the forest and along the streams may be seen alligators, monkeys, parrots, toucans and other creatures without number. Brazil is the home of swarms of bright-colored insects.

114. Northern Realm.

The Northern realm embraces all the lands extending northward from the plateau of Mexico, from the desert of Sahara and from the Himalaya mountains.

All of North America, except its southern part, is within this realm. What large river basins of this continent does the realm include?

Name five river basins of Asia that are in the Northern realm. What part of Asia is not in this realm?

What continent is wholly in the Northern realm? Which part of Africa is in this realm?

Bears are found in many parts of the Northern realm. Of these the grizzly bear of the Rocky mountains is the strongest and fiercest. Black bears prowl in the forest regions of North America, both in the east and in the west. The fur of this species is soft and of a glossy black color. It is often made into robes. Brown bears are found in the Old World, from Japan to Spain.

Largest of all is the polar or white bear of the Arctic regions. It feeds chiefly on seals and fish. In pursuit of these the polar bear often dives into the icy water and swims long distances. This creature is never found far from the sea in which its food lives.

Among the animals which make their home in the highlands of this realm are the bighorn, or Rocky mountain sheep, the chamois and the ibex of the Alps, the Kashmir goat and the yak of Tibet.

The yak is of great service to the people of Tibet. It carries heavy burdens, and supplies milk, meat and warm skins. Wild yaks live at a great height. They have been seen nearly four miles above the level of the sea.

The prairies, steppes and high plains of this realm support millions of cattle, sheep and horses. These animals are not native to any part of America.

Large herds of bisons, often called buffaloes, at one time grazed on the plains east of the Rocky mountains. Many thousand have been killed, and only a few small herds are known to exist. One of these herds is in Yellowstone park and is there protected by law from hunters. The turkey is native to America and is now one of the most valuable of fowl.

Millions of fur-bearing animals live in the great pine-forest belt of the north, both in America and Eurasia.

There the cunning beaver feeds on berries, leaves and bark, and for safety builds its hut at the edge of a lake or a river. The watchful otter follows the streams, looking for fish. The sable, ermine and many other little fur-bearers also make this region their home. The finest and best furs in the world come from the cold parts of the northern realm.

The forest belt of the north is the home of the elk. This animal is noted for its speed and for its broad flat antlers. The American elk is called the *moose*. It is the largest of the deer family.

The reindeer also belongs in the cold regions both of America and the Old World.

The American reindeer on the mainland is called the *caribou*. Reindeer range northward in Greenland to within less than a thousand miles of the pole.

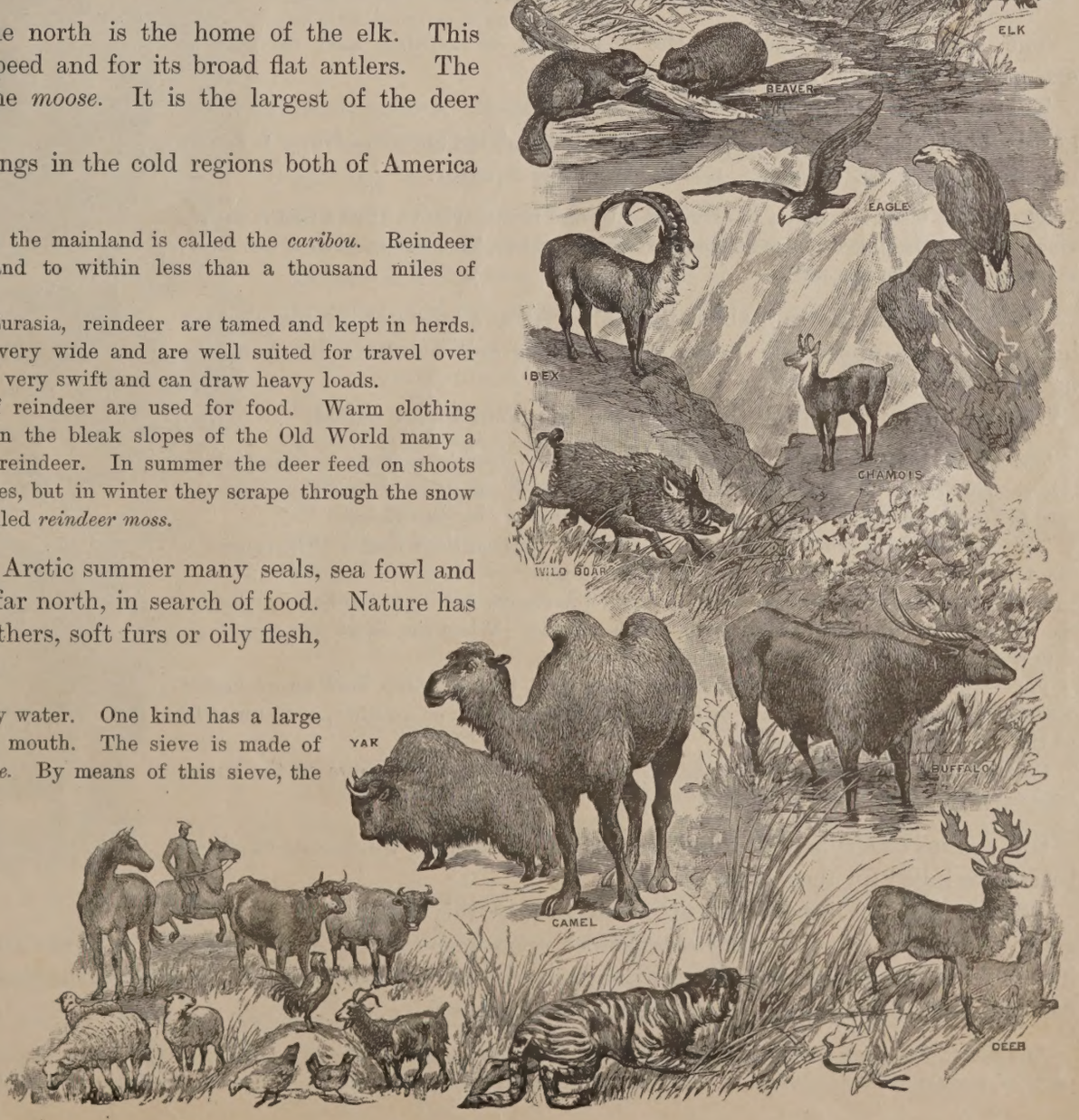
In the northern parts of Eurasia, reindeer are tamed and kept in herds. The hoofs of this deer are very wide and are well suited for travel over snow fields. The reindeer is very swift and can draw heavy loads.

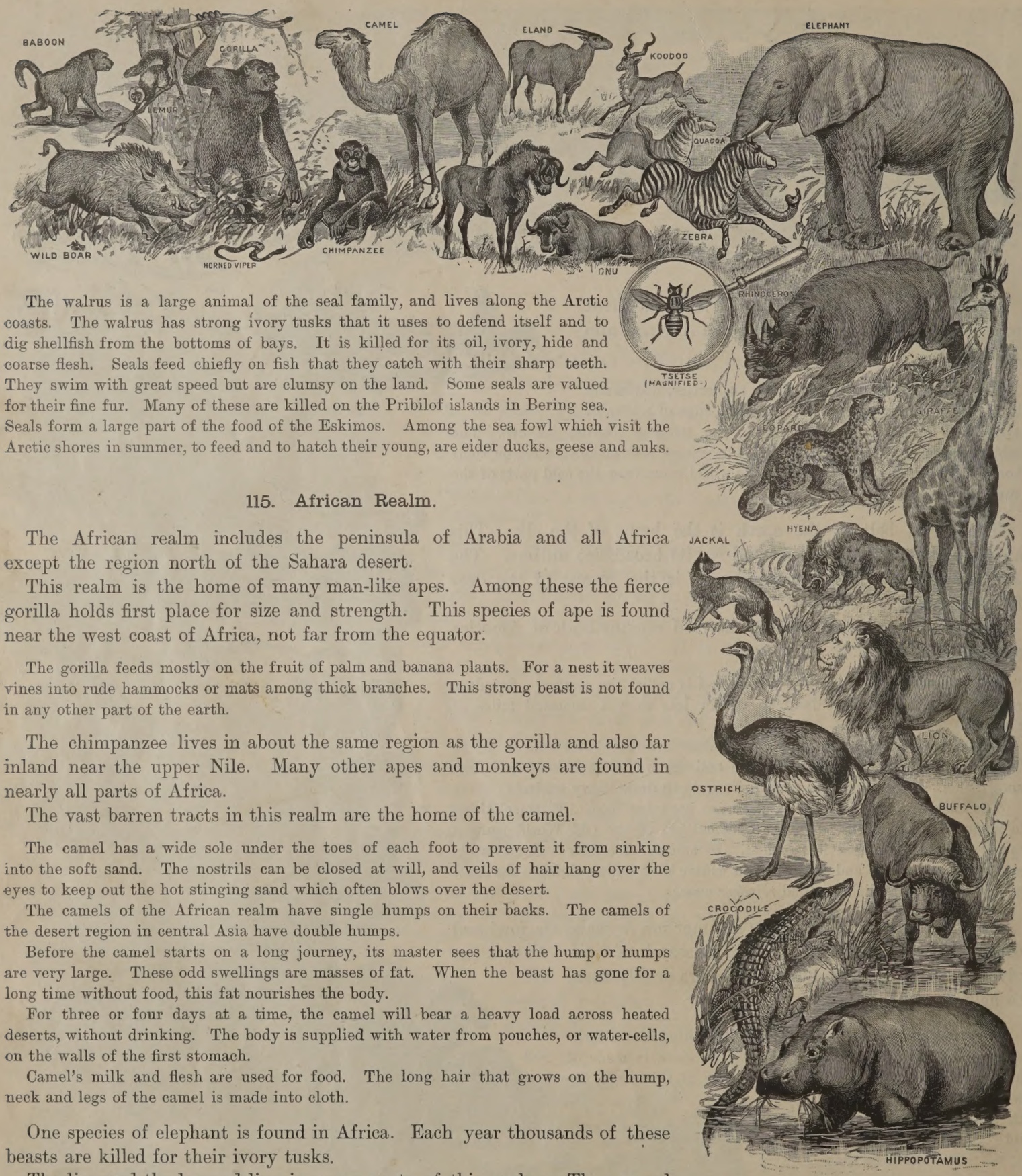
The milk and the flesh of reindeer are used for food. Warm clothing is made from the skins. On the bleak slopes of the Old World many a man's wealth is counted in reindeer. In summer the deer feed on shoots and leaves of shrubs and trees, but in winter they scrape through the snow to find a little gray lichen called *reindeer moss*.

During the very short Arctic summer many seals, sea fowl and other creatures visit the far north, in search of food. Nature has given to them downy feathers, soft furs or oily flesh, to help keep them warm.

Great whales plow the icy water. One kind has a large sieve along each side of the mouth. The sieve is made of horny blades called *whalebone*. By means of this sieve, the whale gathers its food from the sea-water which it takes into its mouth. More than a ton of whalebone has been taken from the mouth of a large whale.

Many whales were formerly killed for their oil. Petroleum has now largely taken the place of whale oil for lighting purposes.





The walrus is a large animal of the seal family, and lives along the Arctic coasts. The walrus has strong ivory tusks that it uses to defend itself and to dig shellfish from the bottoms of bays. It is killed for its oil, ivory, hide and coarse flesh. Seals feed chiefly on fish that they catch with their sharp teeth. They swim with great speed but are clumsy on the land. Some seals are valued for their fine fur. Many of these are killed on the Pribilof islands in Bering sea. Seals form a large part of the food of the Eskimos. Among the sea fowl which visit the Arctic shores in summer, to feed and to hatch their young, are eider ducks, geese and auks.

115. African Realm.

The African realm includes the peninsula of Arabia and all Africa except the region north of the Sahara desert.

This realm is the home of many man-like apes. Among these the fierce gorilla holds first place for size and strength. This species of ape is found near the west coast of Africa, not far from the equator.

The gorilla feeds mostly on the fruit of palm and banana plants. For a nest it weaves vines into rude hammocks or mats among thick branches. This strong beast is not found in any other part of the earth.

The chimpanzee lives in about the same region as the gorilla and also far inland near the upper Nile. Many other apes and monkeys are found in nearly all parts of Africa.

The vast barren tracts in this realm are the home of the camel.

The camel has a wide sole under the toes of each foot to prevent it from sinking into the soft sand. The nostrils can be closed at will, and veils of hair hang over the eyes to keep out the hot stinging sand which often blows over the desert.

The camels of the African realm have single humps on their backs. The camels of the desert region in central Asia have double humps.

Before the camel starts on a long journey, its master sees that the hump or humps are very large. These odd swellings are masses of fat. When the beast has gone for a long time without food, this fat nourishes the body.

For three or four days at a time, the camel will bear a heavy load across heated deserts, without drinking. The body is supplied with water from pouches, or water-cells, on the walls of the first stomach.

Camel's milk and flesh are used for food. The long hair that grows on the hump, neck and legs of the camel is made into cloth.

One species of elephant is found in Africa. Each year thousands of these beasts are killed for their ivory tusks.

The lion and the leopard live in many parts of this realm. They prowl about the places in which they can pounce upon deer and other animals. Among the huge creatures that abound in this realm are the thick-skinned rhinoceros with horned nose, the tall giraffe with long neck, the giant ostrich with fine plumes and the dreaded crocodile with scaly armor.

The tsetse fly is about as large as the house fly and has almost the same colors as the honey bee. The home of this insect is in parts of central and south Africa. The sting of the tsetse fly is fatal to cattle, horses and dogs, but harmless to man.

Cattle are not native to this land, but many cattle are now raised in the parts of the African realm which are free from the tsetse fly. The Cape buffalo is found in the southern half of Africa.

In south and east Africa there are two kinds of animals related to the common horse. These are the zebra and the quagga. They are hard to tame and are of but little use to man. Antelopes in large numbers graze in most parts of this realm. They are the swiftest of four-footed animals. The gnu, or horned horse, is an antelope.

116. Oriental Realm.

The Oriental realm lies southward from the Himalaya and Nanling ranges. *See map on page 132.* This realm extends almost to New Guinea and Australia.

The orang-outan, one of the great man-like apes, is a native of Borneo and Sumatra. Apes of this species weave rude nests among branches and are rarely seen on the ground. Their food consists chiefly of fruits and leaves.

The most useful animals in this realm are the zebu and the buffalo. These are found in nearly all parts of southeast Asia and have spread westward into Africa.

Zebus are a kind of cattle having great humps on their shoulders. Some of these animals are used for riding, and they can travel all day at the rate of five or six miles an hour. Zebus are also used for plowing, drawing carts and doing other kinds of work.

The true buffalo of India is often found in the wild state. Tame buffaloes are useful beasts of burden. These animals have very wide hoofs, and are well suited to work on marshy or soft lands. Many buffaloes are now used as draft animals in the marshy parts of southern Europe.

There are both wild and tame elephants in this realm. Many of these huge beasts are trained to work, but the cost of feeding them is very great, and their places are to a large extent being taken by horses. The cat-like tiger is a native of Asia. It ranges as far north as the Amur river but avoids the great central highland. The lion is also found in this realm.

The tiger feeds on cattle, deer and other animals. This fierce beast often swims from island to island in the Ganges delta.

The one-horned rhinoceros belongs in the Oriental realm. Two species are there found.

This huge beast sleeps during the day and comes from its haunt in the evening to browse on shrubs, leaves and grass.

Large crocodiles, called *gavials*, infest the Ganges delta and the lower parts of many streams in this realm.

These reptiles have long narrow snouts and grow to the length of about sixteen feet. Gavials are of service to man, for they devour the bodies of animals which float down the streams.

117. Australian Realm.

The Australian realm includes Australia, New Guinea, New Zealand and many small islands in the Pacific ocean.

Most of the animals in this realm differ widely from those in other parts of the world. Many have pouches for carrying their helpless young. These pouches are made by folds in the skin on the under side of the body.

The name *kangaroo* is given to several species of pouched animals. Some of these are about the size of rats. Others are as large as men. Large kangaroos are hunted for their skins, from which fine soft leather is made. These animals travel very swiftly, by making long leaps.

The emu is related to the ostrich. The plumage of the emu is long and hair-like, but there are only the rudiments of wings. This bird cannot fly, but it runs with great speed. The emu is hunted for the oil in its skin.

The apteryx of New Zealand belongs to the same order of birds as the emu, the ostrich and the rhea. The duck mole (*ornithorhynchus*) of Australia lays eggs and sits on them, but it is not a bird. The water mole has soft brown fur and may often be seen in ponds and streams. It feeds mostly on insects and worms that live in the water.

The *echidna* is covered with sharp spines. It feeds on ants and other insects. This animal has no teeth, but from a long snout it runs out a sticky tongue to seize its food. The echidna lays eggs but does not sit on them. The eggs are hatched in its warm pouch, and there the little animals also remain till they grow strong.

The Australian realm abounds in black swans, lyre birds, parrots, brush turkeys, pigeons, ducks, geese and other kinds of birds.

Sheep and cattle are not native to Australia, but are now counted there in millions.

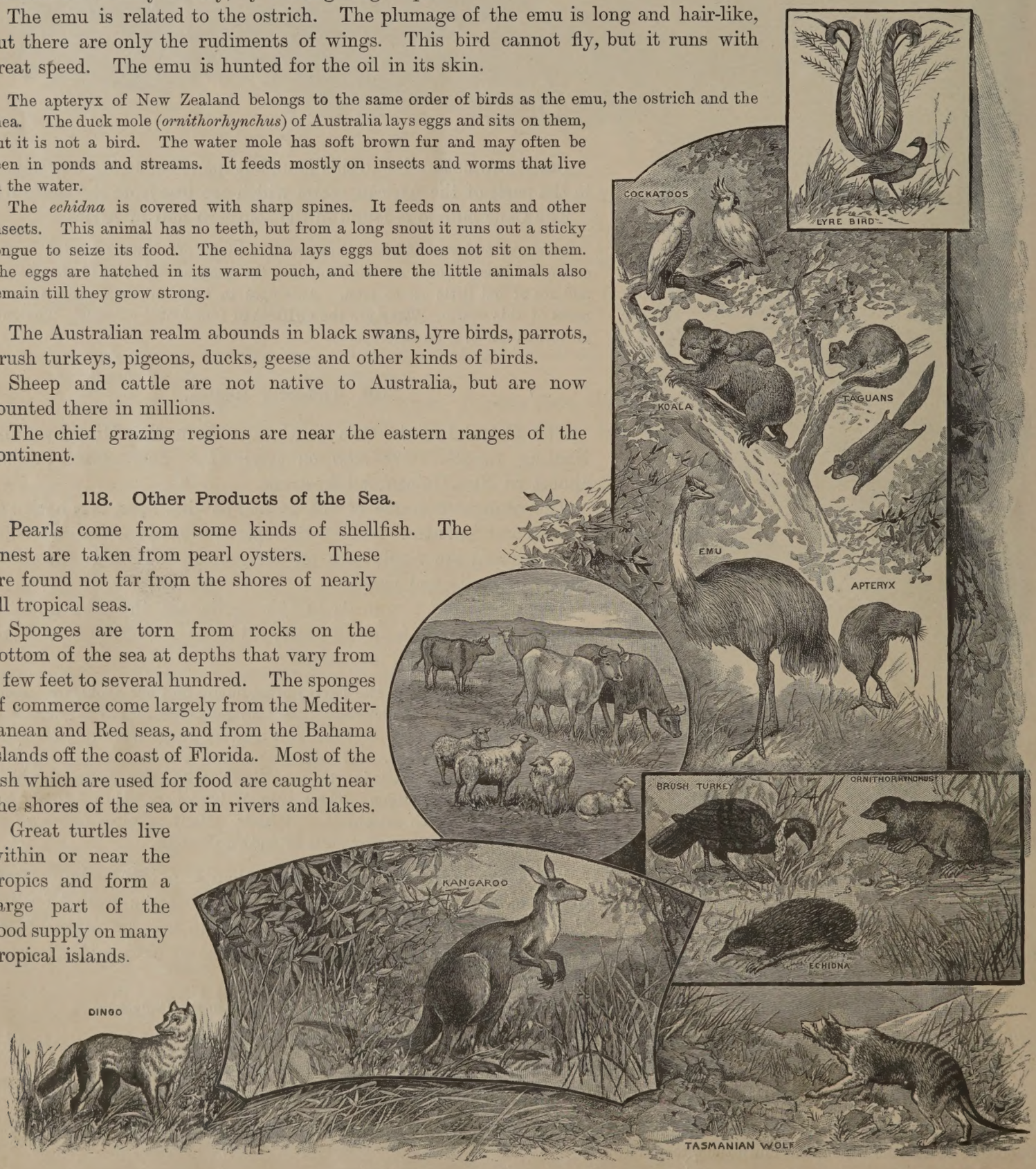
The chief grazing regions are near the eastern ranges of the continent.

118. Other Products of the Sea.

Pearls come from some kinds of shellfish. The finest are taken from pearl oysters. These are found not far from the shores of nearly all tropical seas.

Sponges are torn from rocks on the bottom of the sea at depths that vary from a few feet to several hundred. The sponges of commerce come largely from the Mediterranean and Red seas, and from the Bahama islands off the coast of Florida. Most of the fish which are used for food are caught near the shores of the sea or in rivers and lakes.

Great turtles live within or near the tropics and form a large part of the food supply on many tropical islands.

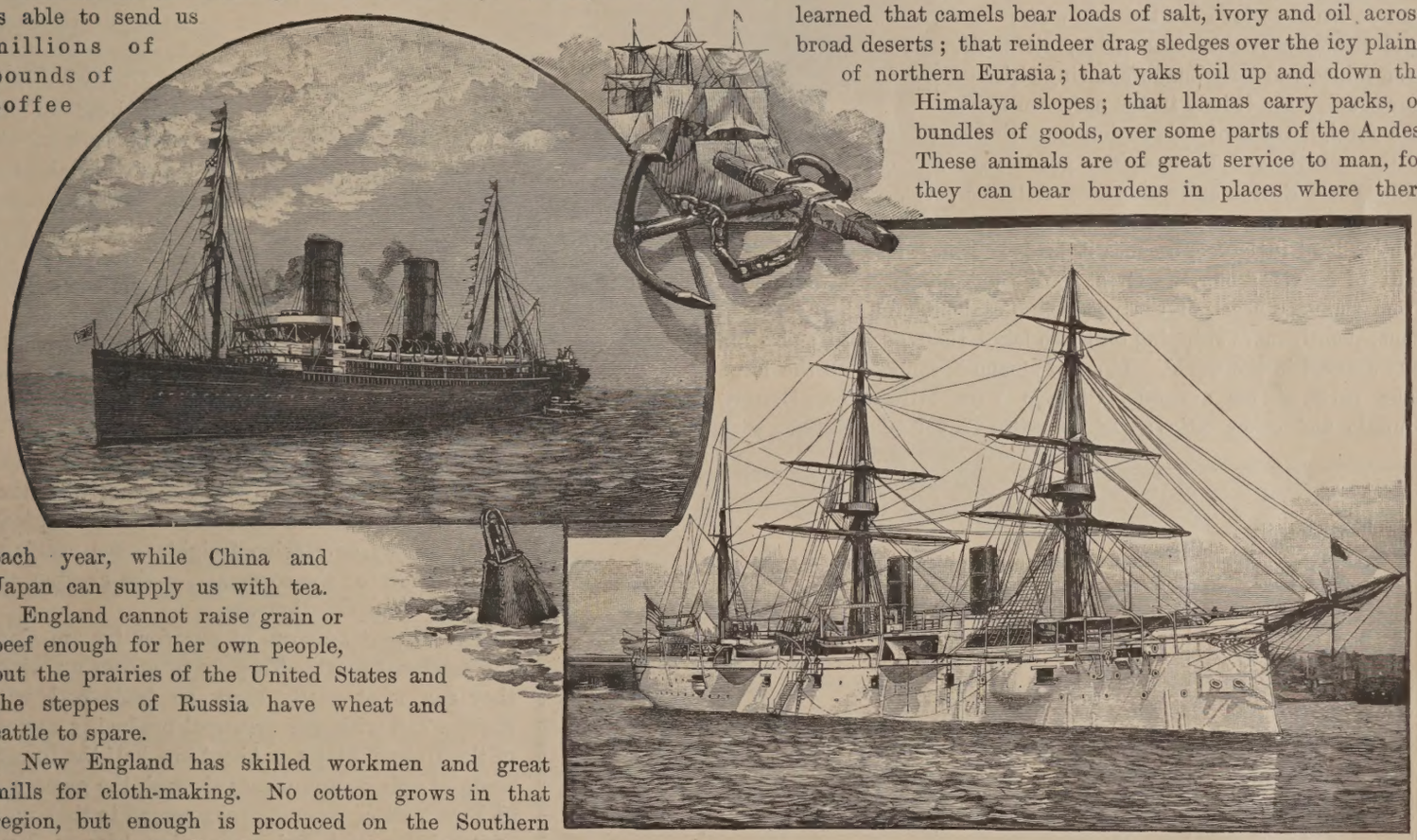


COMMERCE.

119. Domestic and Foreign Commerce.

No state nor country produces all the things which its people need, but each has a surplus of some products.

Neither tea nor coffee grows in our country. Brazil, however, is able to send us millions of pounds of coffee each year, while China and Japan can supply us with tea.



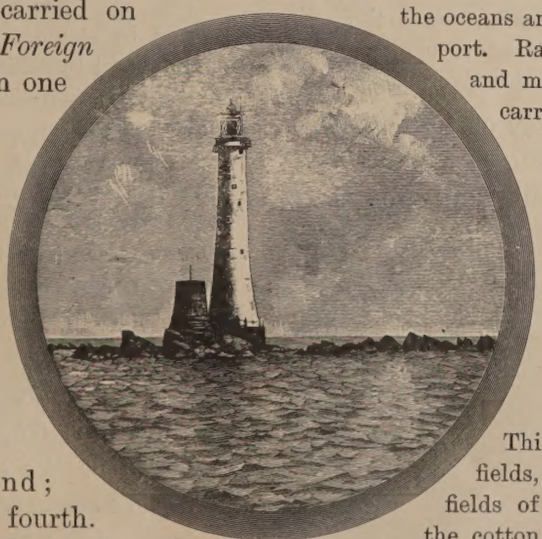
England cannot raise grain or beef enough for her own people, but the prairies of the United States and the steppes of Russia have wheat and cattle to spare.

New England has skilled workmen and great mills for cloth-making. No cotton grows in that region, but enough is produced on the Southern plains to supply all the mills in our own country, and many in Great Britain besides.

The buying and selling, or the exchange of goods, is called *trade*. Trade on a large scale may be called *commerce*. *Domestic* commerce is that carried on between various parts of one country. *Foreign* commerce is that carried on between one country and another.

Which of the following are domestic trade and which are foreign? — Boston sells boots and shoes to the people of Texas. Brazil sends rubber to New York. Chicago sends beef to nearly all parts of our country and to Europe. France exports laces to the United States. Switzerland imports raw silk from Italy.

Great Britain leads in foreign commerce. Germany ranks second; France third; the United States fourth. Our principal exports are *cotton* from the Southern plains; *grain* and *flour* from the prairies; *beef* and *pork* from the prairies and Western plains. Our imports are chiefly *sugar*, *coffee* and *cloth*.



Eddystone Light, Eng.

120. Highways of Trade, — Water Routes.

The principal highways of trade are oceans, railroads, rivers and canals.

Besides the transportation on these great highways, we have learned that camels bear loads of salt, ivory and oil across broad deserts; that reindeer drag sledges over the icy plains of northern Eurasia; that yaks toil up and down the Himalaya slopes; that llamas carry packs, or bundles of goods, over some parts of the Andes. These animals are of great service to man, for they can bear burdens in places where there are no wagon roads, no canals, no rivers, no railroads, no arms of the sea, — none of the greater highways of trade.

Aged people can recall the time when there was not a railroad nor a steamship in the world. In those days the large rivers in trading countries were alive with boats, while sailing vessels on the oceans and inland seas went freighted from port to port. Railroads are now used more than river boats, and most of the freight which goes by water is carried by steamers.

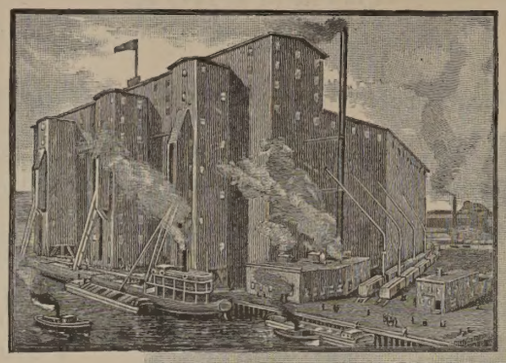
The rivers which are of greatest use as routes of trade are those which are deep and slow, and which flow through the most productive regions.

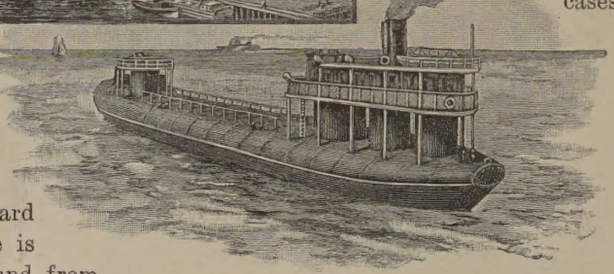
Thus the Mississippi river system forms a great highway of trade for the states which are reached by its navigable streams. This river system branches among the grain-fields, the forests, the grazing lands and the coal fields of the upper Mississippi valley, and among the cotton and sugar plantations of the South. Immense quantities of the products of these regions are freighted on the main river and its branches. Large ocean steamers ascend the Mississippi to New Orleans, to load with cotton, sugar, rice and other products.

Lakes and inland seas that lead in the direction of trade centers are often of greater service than rivers.

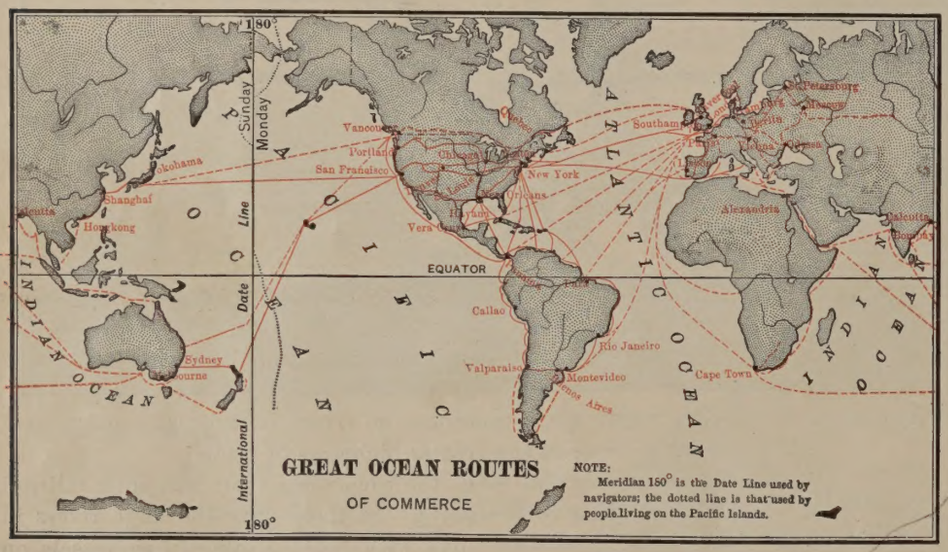
The water way along the Great Lakes is of more importance than any other lake or river route in the world. The rapid growth of trade along this route is due to many causes, among which are the following: The grainfields, pastures, coal fields, oil wells, iron mines and large manufacturing cities of our country are chiefly in the northern half; the foreign trade of this region is carried on mostly with countries of Europe; the goods pass through New York, Boston and other large Atlantic ports.

In this immense east-and-west trade, the Mississippi system is of little use, because it leads southward to the gulf of Mexico; but the Great Lakes extend far eastward from the very heart of the producing regions, and there is consequently more shipping on these lakes than goes to and from any seaport in the world. Lines of steamers connect all the large lake ports, — for example, Chicago with Milwaukee, Detroit, Buffalo and other cities; Detroit with Cleveland; Buffalo with Duluth. Small vessels from the Great Lakes can reach the ocean also, by going down the St. Lawrence river and through the short canals which have been built past rapids in this river.

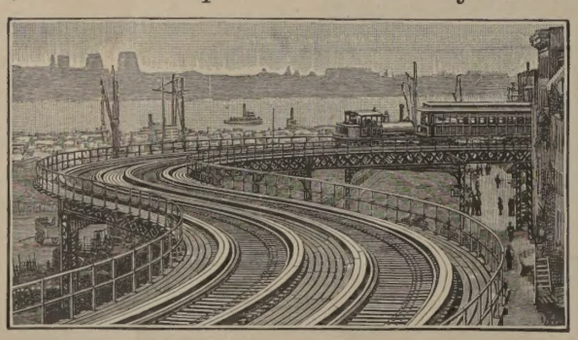




Grain Elevator and Whaleback Steamer.



The oceans form the main highway of trade between distant nations. The sea spreads in one vast body around the continents, so that a ship can sail from any one of the oceans to all the others.



Elevated Railroad, New York.

Seaports handle freight for ocean commerce. The best ports are on deep and spacious harbors sheltered from gales and storm-waves. The largest ports grow where they can most easily handle exports and imports. Such cities are built as near as possible to the producing regions, — whether farms, forests, mines or manufacturing centers; for the exports must be taken to the shipping points, and the imports must be distributed from those points.

Many large seaports, such as London, New York, Liverpool, Boston and San Francisco, are on deep harbors formed by the slight drowning of river valleys. The harbors are in many cases some distance inland, at the head of the drowned part of the valleys. Tidal currents flowing in and out of the rivers help vessels to enter and clear from the ports.

Thus, London is seventy miles from the mouth of the Thames, — 70 miles inland towards the farms and workshops of busy England. Montreal is about 1000 miles up the drowned valley of the St. Lawrence. Philadelphia and Baltimore are near the heads of two bays in slightly-drowned valleys. The nearer a steamer can go to the places which supply or receive freight, — the nearer to the producer or the consumer, — the cheaper the rates of transportation are.

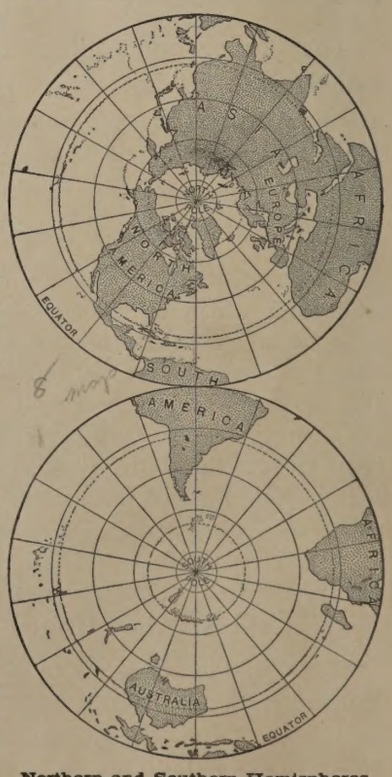
The largest seaports of our country are along the northeast coast. They have grown up where they can most easily carry on trade both with Europe and with the principal producing regions of the United States. About one half the foreign trade of our nation passes through the great port of New York.[1] Boston ranks second to that port. Philadelphia and Baltimore also have a large foreign and coastwise trade.

The larger map on this page shows the principal routes followed by steamers, and to a certain extent by sailing vessels. The dotted lines indicate routes followed by foreign vessels. The solid lines show the principal routes of steamers owned in the United States.

Name six foreign ports that can be reached by American lines of steamers.

England, with her extensive manufactures and her numerous colonies, has grown to be the center of the world's ocean commerce.

[1] The *port* or *customs district* of New York embraces the city of New York, including Brooklyn, together with Jersey City and adjacent places on New York bay.

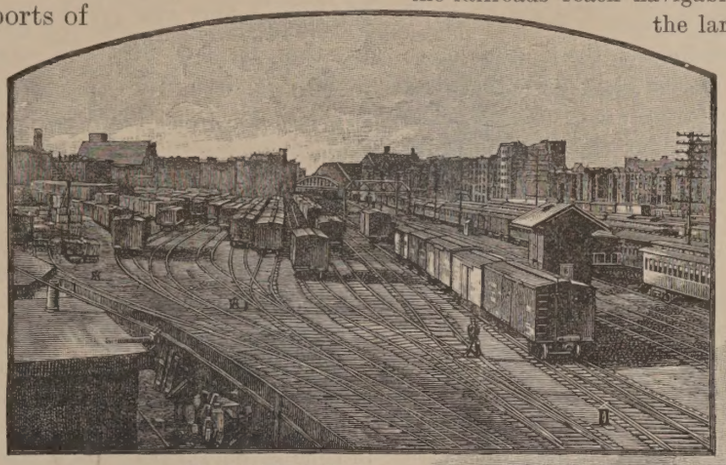


Northern and Southern Hemispheres.

From western Europe the chief routes are as follows: By way of the Suez canal to Asia and Australia; west and southwest to America; south to the cape of Good Hope, and thence to Australia and Asia.

From the large Atlantic ports of the United States the routes are as follows: Eastward to Europe; southeast to the cape of Good Hope, and thence to Australia, southeast Asia and the East Indies; southward along the Atlantic coast, around cape Horn, and thence to the Pacific ports of America.

From San Francisco, the routes lead westward to Asia; and southwest to Australia.



Freight Yard, Boston.

121. Railroads.

In progressive countries, railroads are fast taking the trade away from rivers and canals. For a long time after railroads came into use, freight charges by rail were very high, while the rates on rivers and canals were much lower. In recent years, the charges on railroads have become so low that most of the freight goes in cars.

The building of steam railroads in the United States began about 1830. The first railroad west of the Mississippi river was built about fifty years ago. The first road from the Atlantic coast to the Pacific was completed in 1869.

Most of the railroads in the world are in the United States and Europe, and nearly one half of these roads are in our country.

The railroads of the United States are four times as long as its navigable rivers, or long enough to reach about seven times around the earth. If these railroads were destroyed, all the gold and silver money in the world would not pay for rebuilding them.

The growth of railroads in the United States is due chiefly to the value of the products in widely-separated regions; to the lack of rivers flowing from the inland districts to the eastern seaboard; and to the fact that the surface of a great portion of the country is so level that the railroads are constructed at low cost.

For many years, railroads were built to carry passengers and freight between thickly settled regions, but some of the newer lines have opened the way into unsettled lands and have thus led to the peopling of large areas. Before the railroads were built, these lands were of little value, for there was no way to send products from them to the great centers of trade.

In early times, inland towns and cities grew most rapidly along the rivers, lakes and canals, but now the most rapid growth in many parts of our country is due almost wholly to railroads. The best locations are of course at the junctions of railroads or where the railroads reach navigable waters. Thus, Chicago is not only the largest lake port in the world, but it is also the greatest railroad center.

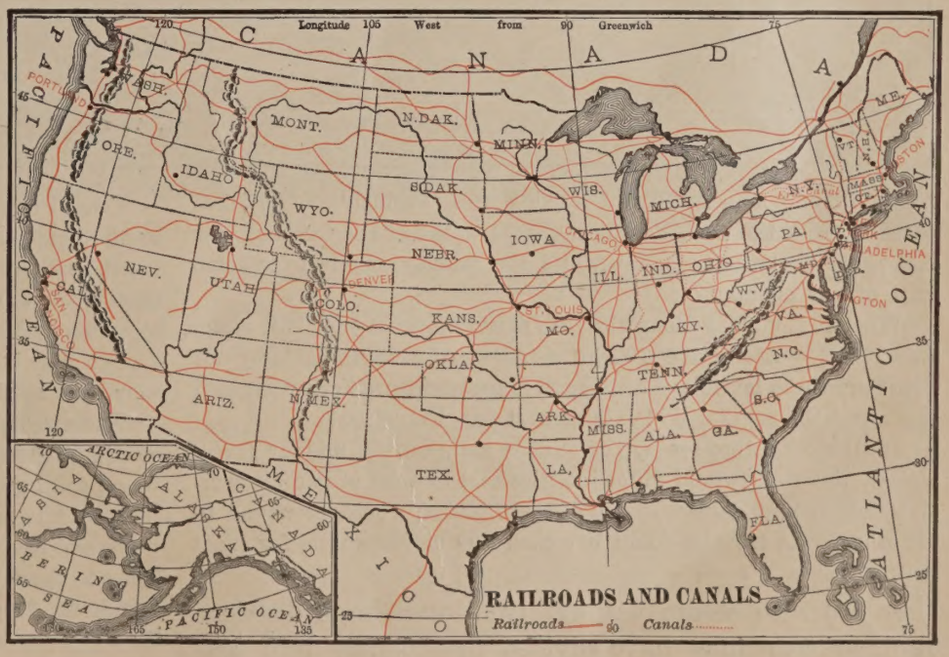
One of the maps on this page shows the most important railroad and canal routes in the United States. Still others appear on the large maps of the *Supplement*, showing the various groups of states. Nearly every city and town in our country can now be reached by way of one or more lines of railroad.

122. Aids to Commerce.

The commerce of the world is of such great importance that nations seek in every way to foster it.

Lighthouses are built on dangerous coasts and along the main channels of harbors. Beacons, buoys, bells, foghorns and lightships are placed where they are most likely to give warning of danger.

Along many parts of the coast, men and boats are stationed to assist vessels in distress and to try to save the lives of sailors whose vessels are wrecked. *See picture on page 16.* Harbors are dredged and thus deepened; rocks are removed from channels; sea-walls are built to shelter vessels from dangerous storm-waves.



Commercial nations employ men known as *consuls* in all the large seaports. The consuls try to promote trade, to protect shipping, and to secure rights that belong to the sailors of their nations. To assist in this work, armed vessels are kept in readiness to go to any port where commerce needs protection. One of the pictures on page 119 shows a modern warship belonging to the United States.

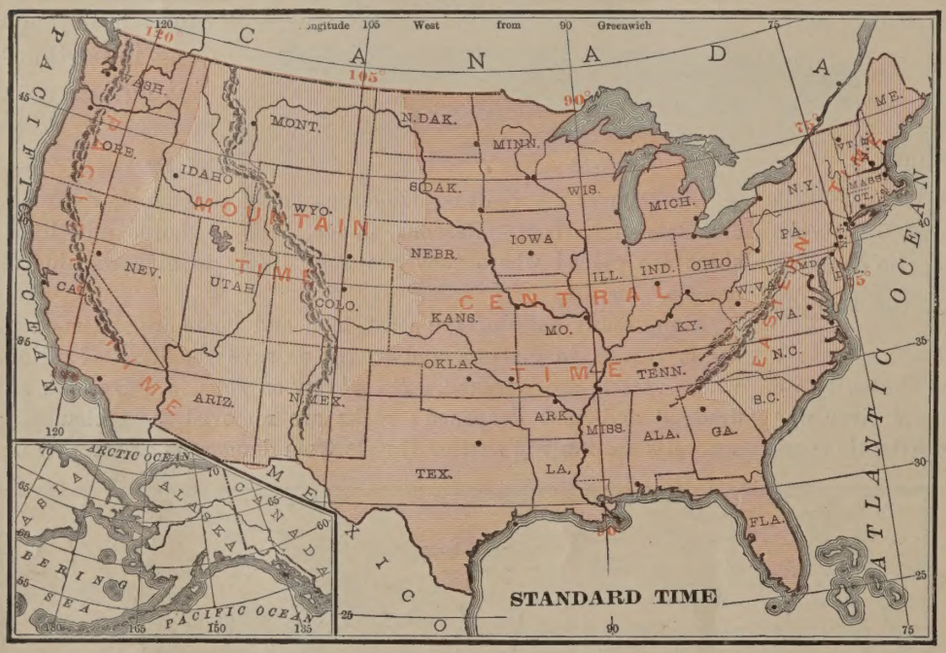
Ocean cables, or lines of telegraph under the sea, are a valuable aid to commerce. When a steamer sails with freight for a foreign port, agents abroad can be cabled when to expect it and what to do with it. Consuls also can cable for help in times of trouble, and important news of all kinds can be sent along these wires laid deep in the sea.[1]

The regular mails and the telegraph lines on the land are of so much assistance to trade that when storms blow down the wires and block the mail trains, the wholesale trade almost ceases. The telephone also has recently taken an important place in the world of commerce.

123. Time Belts and International Date Line.

As the earth rotates from west to east, Boston is turned into the sunlight about an hour earlier each morning than Chicago. After sunrise in Chicago, darkness continues for more than two hours in San Francisco. Can you tell why?

How many degrees are there in a circle? In how many hours does the earth rotate 360°? How many degrees does the earth rotate in one hour? The United States, exclusive of Alaska, extends from the 67th meridian almost to the 125th. About how many hours elapse each day while the midday sun is over some part of our country?



When it is midday along the 75th meridian, what time is it along the 90th? — Along the 105th? — Along the 120th? How far apart are these meridians? Which is nearest New York? Which is nearest Chicago? Which is nearest San Francisco?

If all clocks were set by the midday sun, calling midday *twelve o'clock*, the time would differ in cities east or west of one another. A watch, though correct in one of these places, would be wrong in all others. A traveler could not then rely on his watch, for exact railroad time.

In order to secure uniform time over large districts, railroad companies have divided the country into four belts, each of which takes its time from a certain meridian. Timepieces in the Eastern belt are set by the true or *mean solar* time on the 75th meridian. All timepieces therefore in Boston, New York, Philadelphia, Washington, Richmond, and all other places in this belt, are regulated to agree.[2]

In like manner, all places in the Central belt, the Mountain belt and the Pacific belt take their time from the meridians of 90°, 105° and 120° respectively. As these meridians are 15° apart, the time in each belt differs exactly one hour from the time in the belt on either side.

The time in general use over a belt is called *standard time* or *railroad time*.

In going from one time belt into another, travelers set their watches forward or back *one hour*. Traveling eastward, which way should the hands of a watch be moved when another time belt is reached?

The borders of the time belts are made irregular to favor railroad companies that wish to use uniform time over very large areas. Which of these belts is the widest? How many hours difference in time is there between Boston and San Francisco?

International Date Line. The common day, often called the *civil day*, lasts from midnight to midnight, — twenty-four hours. In order that the civil day may have the same number or *date* the world around, the leading nations have agreed to use the date of the days as they begin on the 180th meridian.

For example, the fourth day of July begins on the 180th meridian at midnight following the third of July. At that time it is midday of the third of July in Greenwich; and six o'clock in the morning of the same day in New Orleans, 90° W. Then as the earth rotates towards the east, both London and New Orleans are turned into darkness, the one six hours ahead of the other. As soon as it is midnight in London, that city begins to count the new date of July 4th; six hours later New Orleans has its midnight and then its fourth of July begins.

Thus it is with every city, — its dates are counted from midnight to midnight, and each day takes the same date as that given to the latest new day on the 180th meridian. We may think of the new date as traveling westward with the midnight. This date is given to each place as soon as the midnight reaches it. When midnight again occurs on the 180th meridian, another date begins its journey round the earth.

When vessels cross the 180th meridian, they either drop a day or add one to the calendar. As the new date begins on that line, a vessel sailing eastward across the line goes out of the area having the new date and must therefore go back a day. Sailing westward, the vessel enters the area having a new day and must therefore add a day to the calendar. Thus when sailing eastward across the line, Monday is dropped for Sunday; but sailing westward over the line, Saturday at once gives place to Sunday.

The meridian of 180°, at which all new civil days begin, is called the "International date line."[2]

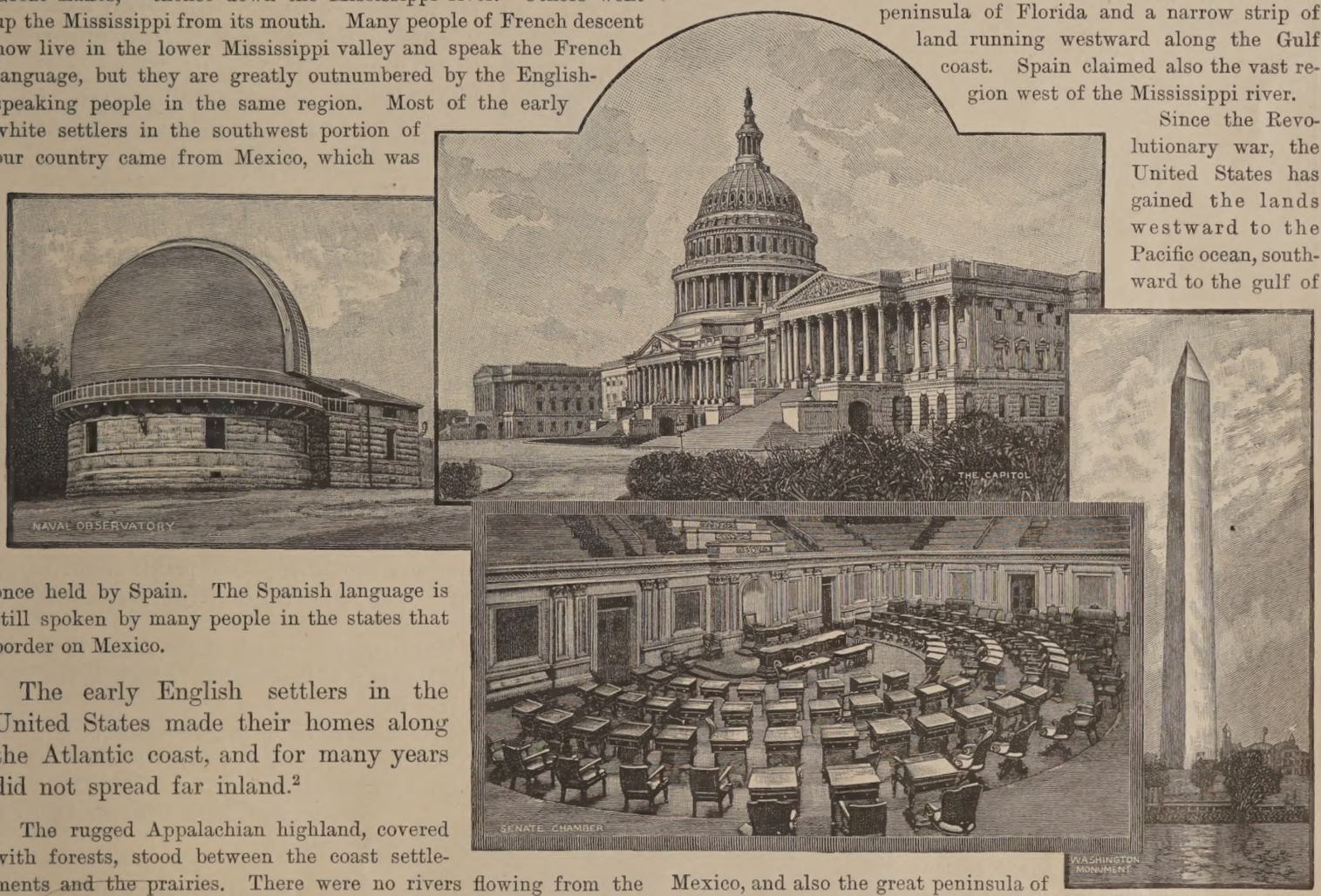
[1] The large commercial map of the world, in the *Supplement*, shows the routes of the cables.

[2] In order to avoid confusion in dates, the people living on islands on either side of this line date the days of the week to agree with the nearest large land with which they trade.

124. Distribution of People.[1]

After the famous voyage of Columbus, in 1492, the various nations of western Europe sent expeditions to explore and settle the New World. Foremost among these nations were England, France and Spain.

The French explorers went up the St. Lawrence river and the Great Lakes, — thence down the Mississippi river. Others went up the Mississippi from its mouth. Many people of French descent now live in the lower Mississippi valley and speak the French language, but they are greatly outnumbered by the English-speaking people in the same region. Most of the early white settlers in the southwest portion of our country came from Mexico, which was once held by Spain. The Spanish language is still spoken by many people in the states that border on Mexico.



The early English settlers in the United States made their homes along the Atlantic coast, and for many years did not spread far inland.[2]

The rugged Appalachian highland, covered with forests, stood between the coast settlements and the prairies. There were no rivers flowing from the prairies to the east coast of the United States. European nations hostile to the English claimed the St. Lawrence and Mississippi river systems, and for many years the English colonists could not use those water ways.

The valley of the Hudson and Mohawk rivers would have opened a way to the Great Lakes, if its upper part had not been held by warlike Indian tribes. Other tribes farther south also held the lands a little back from the coast.

At length the year 1776 arrived, and with it came great changes in the colonies. Great Britain had long made the colonists pay taxes which they had no share in voting, but in that year the colonies took the name of *states* and chose brave men who met in Philadelphia and voted that their land should be no longer under British rule. After a long struggle, known as the *Revolutionary war*, Great Britain gave up her claim to the thirteen colonies.[3]

In 1776 the states voted themselves free and independent, and all the states together were called the *United States of America*.

At the close of the Revolutionary war our country reached from the Atlantic coast to the Mississippi river, but Spain then held the peninsula of Florida and a narrow strip of land running westward along the Gulf coast. Spain claimed also the vast region west of the Mississippi river.

Since the Revolutionary war, the United States has gained the lands westward to the Pacific ocean, southward to the gulf of Mexico, and also the great peninsula of Alaska. The area is now a little more than 3,600,000 square miles.

When the struggle for freedom was over, many people moved into the Allegheny plateau region and still farther westward along the river branches. After a time wagon roads were made across the Appalachian highland, and later came the Erie canal and the railroads. Then the growth of the country became very rapid, especially when the prairies were reached and the fertile open lands were found ready for millions of settlers. Forts and trading stations on the rivers, the Great Lakes, the Erie canal and the railroads, soon grew to towns and cities.

While the upper half of the Mississippi valley was thus being settled, a great change was also taking place in the

[1] There is a map of the United States on page 126.

[2] Among the important settlements made by colonists of nations other than the British were the following: the Dutch along the Hudson river; the Swedes near the mouth of the Delaware river; the French around Charleston, S. C.; the Spaniards in Florida.

[3] They were: New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia. North Carolina, South Carolina and Georgia.

Southern plains. Thousands of acres were planted with cotton, and the region was very rapidly growing in wealth and population.

Until about a century ago, cotton fiber was separated by hand from the seeds. This was slow work, for a person could pick only about a pound of fiber in a day. The price of cotton was therefore high, and poor people could not afford to use much cotton cloth.

NOTE. — The dots on the above map show the location of cities and large towns. The largest cities are indicated by the largest dots. The star on the map shows the center of population according to latest census.

At length a machine was made to separate the fiber from the seeds. The machine was called a *cotton engine*, — now shortened to *cotton gin*. It has saw-teeth that draw the fibers through slits too narrow to admit the seeds. A large gin can clean about twenty bales of cotton in a day. A bale weighs about 500 pounds.

Before the cotton gin was invented, machines had been made for spinning or twisting fibers into thread and for weaving the thread into cloth. There was a large and growing demand for cotton. The new machine made it possible to supply this fiber without great expense and thus led to the planting of cotton in all the states of the Southern plains. Cotton has for many years been the leading crop in that region.

Soon after the first English colonists came to this country, they received a cargo of slaves from Africa. Slavery spread with the growth of the country, but the slaves proved to be of greatest service in the cotton and the tobacco fields of the South. The invention of the cotton gin created a great demand for cheap labor in the cotton fields, and people of the black race were brought in shiploads from Africa.

At length all the slaves in our country were set free, and most of them made their homes on the Southern plains where they had worked and where many of them had been born. About one tenth of the people in the United States are Negroes.

About fifty years ago, gold was discovered in California, and many thousand people flocked there in search of fortunes. Some toiled across the dry Western plains and the Rocky mountain highland. Others reached the gold fields by way of the isthmus of Panama, — going by water to and from that neck of land. Shiploads of gold-seekers went round cape Horn and thence up the Pacific coast to San Francisco. Gold in the Sierra Nevada led to the settling of California; but products of far greater value are now taken from the grainfields, the vineyards, the fruit groves and the pastures of that state. Silver and gold have also been found in other parts of the western highland, and towns and cities have grown up in many places near the rich mines.

In 1776 the population of the United States was less than 3,000,000. Now it is about 84,000,000, including Alaska and the island possessions, or nearly one twentieth of the total population of the world.

The rapid growth of our country has been largely due to the great number of immigrants who have come from Europe, — mainly from the British Isles, Germany, Italy and Russia.[1]

Which coast of the United States is the most thickly settled? Why?

Which has the greater population, — the prairie region or the western highlands? What part of our country is the most thickly settled? Why?

Where are the cities larger, — on the Great Lakes or on the gulf of Mexico? Which part of the Mississippi basin is the most thickly settled? Why?

Why are there so few cities or towns on the Western plains? In the Great Basin? On the Columbia plateau? On the Colorado plateaus? In the great peninsula of Alaska?

Let us now learn how our nation is governed.

Market in "Chinatown," San Francisco.

125. Government.

The highest law of the nation is known as the *Constitution of the United States*. This written law, or body of laws, was adopted in Philadelphia, in 1787,[2] by men chosen from the thirteen states. It has since received several additions, or *amendments*.

The Constitution outlines the form of our government; names the various offices; indicates how the offices are to be filled; defines the authority of the officers; limits the power of the law-makers; provides for a Supreme Court to decide questions that may arise as to the powers of the national government; and, in general, forms the highest law of the land.

[1] There are also about 119,000 Chinese in the United States. Their largest colony is in San Francisco.

[2] The Constitution went into effect on March 4, 1789.

The law-making, or *legislative*, department of the United States is known as *Congress*. It consists of two bodies, — the *Senate* and the *House of Representatives*.

The representatives are chosen by the people. The senators are chosen by the law-making bodies, or *legislatures*, in the various states. There are two senators from each state, but the representatives are chosen according to the number of people in each state. Senators are elected to serve for six years; representatives, for two years.

The chief executive officer is called the *President*. He is elected to serve for four years, and his chief duty is to enforce or execute the laws. He is Commander-in-chief of the army and navy of the United States.

To aid in governing, the President (with the approval of the Senate) appoints nine men who are known as members of the *Cabinet*. They superintend the foreign affairs, the money, the army, the navy, the internal affairs, the commerce, the law cases, the post offices, and the agricultural interests, of the nation.

With the President is elected a *Vice-President* who presides over the Senate and who succeeds to the office of President, if it becomes vacant during his term.

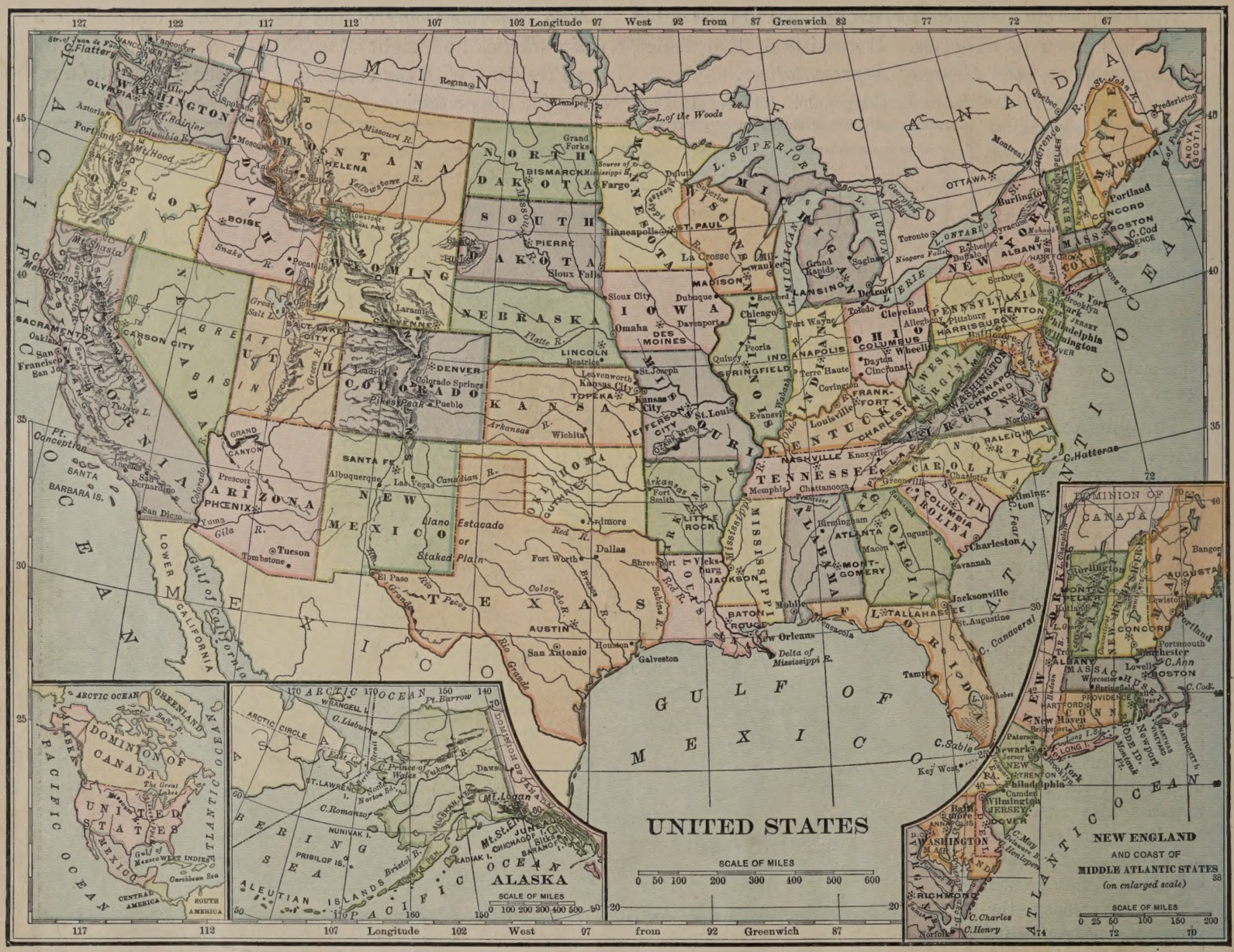
The President and Vice-President are generally chosen by *electors* who are elected by the people. If the electors fail to agree, the national House of Representatives elects a President, and the Senate elects a Vice-President.

A *bill* becomes a national *law* when it receives the consent of a majority of each body of law-makers and the approval of the President. If the President disapproves or *vetoes* a bill, it cannot become a law without receiving a two-thirds vote of each body, — Senate and House of Representatives.

The *Supreme Court* of the United States consists of a *Chief Justice* and eight *Associate Justices* appointed by the President, with the consent of the Senate, and holding office for life or during good behavior.

The chief duty of the Supreme Court is to protect the rights of the people, according to the Constitution.

All powers that the states did not give to the nation, under the Constitution, they reserved for themselves. There are now forty-five states, and each resembles a republic. Each has its constitution, its Senate and House



of Representatives, its Supreme Court, its chief executive officer called a *Governor*, — as well as other officers.

Some portions of our country do not belong in any state, but are known as *territories*. Their governors and judges are appointed by the President, with the consent of the Senate, but the people of each territory elect their other officers. The territories have also their own legislative bodies.

There are now four territories,[1] as follows: Alaska, Arizona, Hawaii, New Mexico. From time to time, as the territories increase in population, they are admitted into the Union as states. There are also many island possessions.

The city of Washington, with its suburb Georgetown, is on a tract of land set apart for the use of the government. This tract is known as the *District of Columbia*. It is neither a state nor a territory, but is under the control of Congress.

[1] In 1906 Congress voted to form the state of Oklahoma out of the two territories of Oklahoma and Indian Territory. The latter was for many years set apart as a home for several tribes of Indians, but many white people also lived there.

Congress meets in Washington, the Supreme Court sits there, the President resides in that city, and the members of the Cabinet have their offices there.

The United States has grown to be the foremost republic and the wealthiest nation in the world.

126. Map Studies.

Bound the United States. Bound the state in which you live.

Which states border on the Atlantic ocean? Which of these states contain no part of the coastal plain?

What state in the New England highland has no seacoast? Where are the White mountains? — The Green mountains? In which states does the piedmont belt reach the coast?

Which of the Great Lakes border on New York? What lake is between that state and Vermont?

Name the river between Pennsylvania and New Jersey. Which states are on Delaware bay? — On Chesapeake bay? Name the states which border on lake Erie. Which are separated by the Potomac river? The city of Washington is in the District of Columbia; on what river is it built?

What states are grouped around the Carolina highland? Which of these are partly in the piedmont belt? Between what states

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Key to Relief Map on pages 34 and 35.

does the Savannah river flow? What states are crossed by the divide between the Atlantic and the Gulf coastal plains?

Name the states which border on the gulf of Mexico. In which of these is the Mississippi delta? What river separates Texas from Mexico? Between which of the Gulf states does the Mississippi river flow?

In what state does the Mississippi rise? Name the states along the east bank of that river; — along the west bank. Between what states does the Ohio river flow? Which of these states are wholly or in part in the Allegheny plateau?

Name the states which border on lake Michigan; on lake Superior. Which of the Great Lakes partly surround Michigan? Which states are partly in the St. Lawrence basin and partly in the Mississippi basin?

What two large rivers are near the southern and western borders of the prairies of the upper Mississippi?

Which states are partly in the prairies and partly in the Western plains? Which states are crossed by the Rocky mountains?

Name the two states that are almost wholly in the Basin region. What three states include the Columbia plateau region? What states are crossed by the Cascade range? In which state is the Sierra Nevada? Name the states lying along the Pacific coast.

Which states border on Canada? Which states and territories are next to Mexico? Name the states crossed by the Arkansas river.

Which is the largest state in our country?

What bodies of water partly surround Alaska? What country is on the east of that territory? Where are the Pribilof islands?

127. Climate, — Temperature.

What belts of heat cross the United States? How do the seasons on the land in these belts differ from the seasons over the oceans on the east and west? *See lesson 26.*

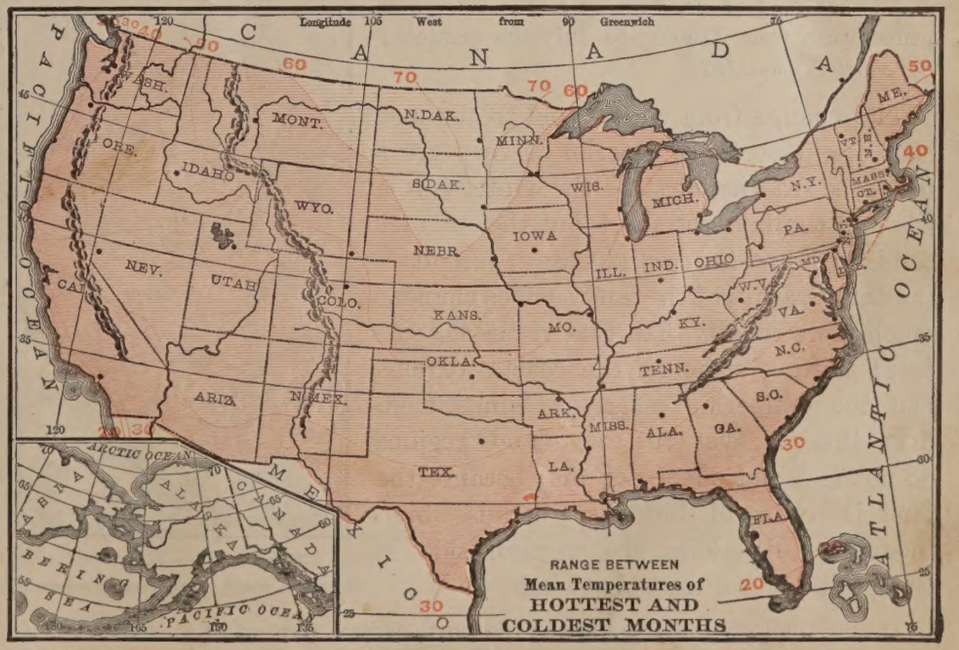


CHART A. — The above map shows that the greatest difference between January and July temperature is found on the northern part of the prairies and Western plains. There is less difference along the southern boundary and western coast.

At about what part of the distance from the equator to the pole is the mouth of the Mississippi? — The middle of Lake Huron? What does this show about the location of our country?

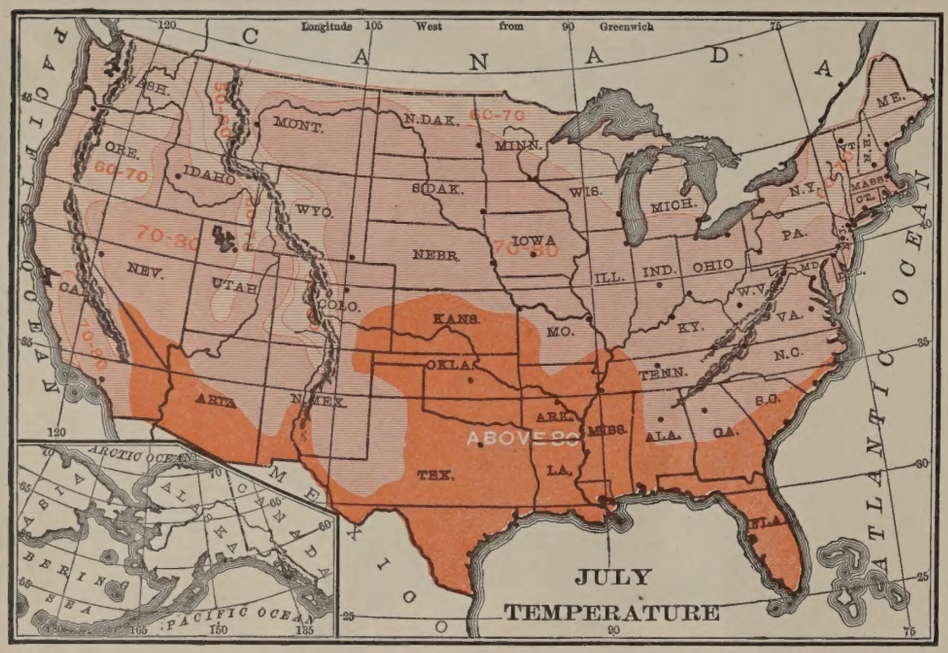


CHART B. — The greatest heat reaches northward in the middle of the country. The cooler regions are along the northern boundary, on the mountains, and along the western coast.

Our country lies between the steady heat of the equatorial regions and the extreme seasons of the polar cap.

From winter to summer, the change in the length of day and the strength of sunshine makes a great change in temperature over our country, but greater in the north than in the south. In winter the rivers and most of the lakes in the northern part of the United States are frozen; the snow-caps of the mountains reach far down into the valleys, and even the lowlands are sheeted over with snow that spreads farther south as the winter season advances.

As the days lengthen and the sunshine becomes stronger, the snow and ice melt away. Plant and animal activity begin again.

In what part of our country is the change of temperature from January to July the greatest? *See chart A, page 127.*

The change from winter cold to summer heat in our northern interior is very great for three reasons: first, — the winter sun is low and the daylight short, but the summer sun is high and the daylight long; second, — the temperature of the land surface changes much more rapidly than that of the sea surface; third, — although the coastal regions feel the tempering effect of winds from over the sea, yet the far-inland regions do not feel that effect, not only because the land is so broad, but also because high mountains lie along the western side in the path of the westerly winds.

During the long winter nights in the north-central part of our country, when the calm dry air rests on the broad sheet of snow, the temperature may fall to 40° or 50° below zero. In extreme cold, spirit thermometers are used; for mercury freezes at 39° below zero.

Although the winters in this district are so severe, the temperature rises rapidly in spring. There the long days of summer ripen great crops of wheat even northward in Canada. Cattle that can barely survive the winter climate find abundant pasturage in summer on the grassy plains. The noonday heat may then reach 90° or 100°, even at our northern boundary.

What is the difference of temperature between the Gulf coast and the northern part of Minnesota in January? — In July? *See charts B and C.*

The contrast of temperature between our southern and northern boundaries is very strong in winter, but slight in summer. Many plants that live only through the warm season thrive from the Gulf to the Great Lakes, but longer-lived plants that cannot survive cold winters are found only in the south.

The range of temperature from summer to winter on the Pacific coast is small (*see chart A*), because the westerly winds from over the broad Pacific temper the climate. They are warmer than the land in winter, but cooler in summer. As these westerly winds blow across our country, they gradually take the temperature of the land over which they move. Thus they carry the great heat of summer or the severe cold of winter out from the interior to the east coast. The changes of seasons on this coast are much stronger than on the western coast.

The great difference of temperature between the northern and southern parts of our Atlantic coast is partly the effect of the ocean currents. Off this coast the warm Gulf stream and the cold polar or Labrador current approach each other and tend to bring unlike temperatures together. The effect is felt on the coast whenever the winds blow inland. No polar current reaches our western coast.

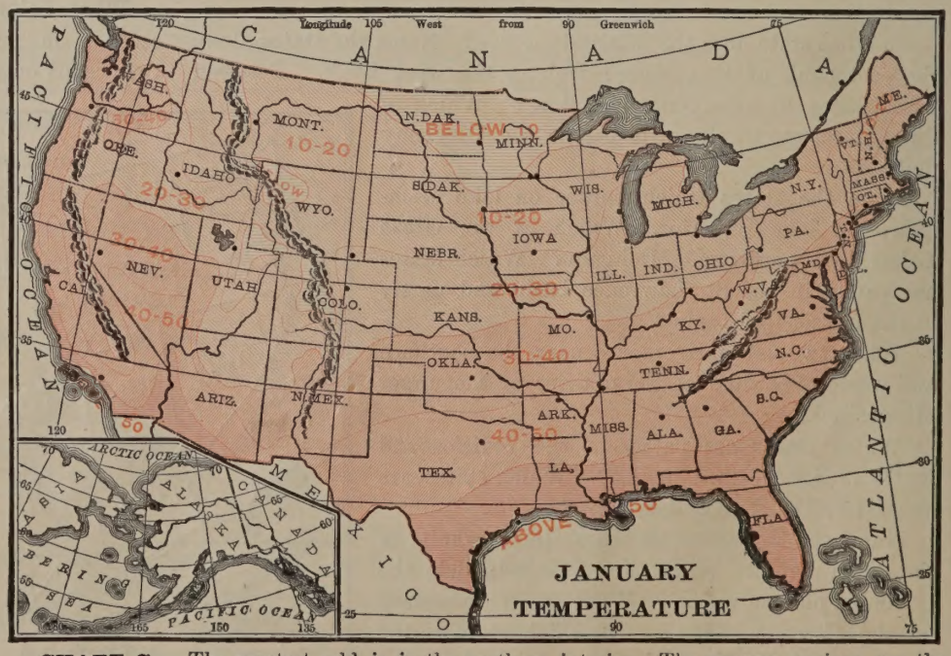


CHART C. — The greatest cold is in the northern interior. The warmer regions are the western coast, the southern boundary, and the southeastern coast.

128. Climate, — Winds and Rainfall.

Although winds from some westerly point prevail at most places in our country, yet their direction is variable.

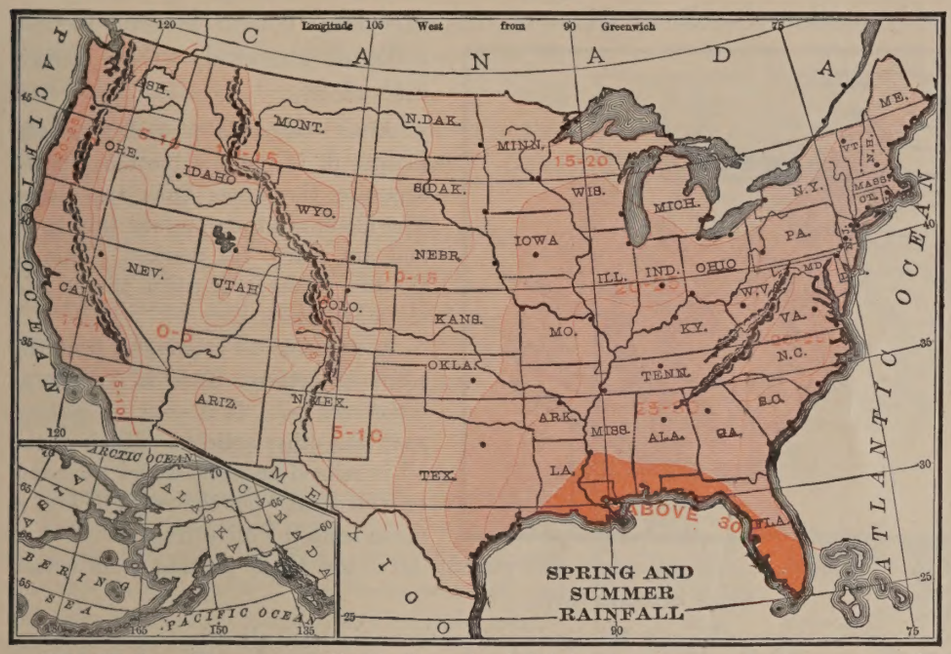


CHART D — The general distribution of rainfall for these seasons is the same as that for the year; but the northwestern coast has less than half its total rainfall during these seasons, while the southeastern coast and much of the Mississippi valley have more than half.

They generally blow more from the land to the sea in winter, and more from the sea to the land in summer. *See charts on page 24.* The winds change their direction and strength also with every passing storm-eddy. *See chart on page 23.*

Smoke from forest fires commonly spreads eastward. Clouds, especially the higher ones, generally drift from some western point. Thunderstorms usually travel from west to east. Even the great eddying storms move eastward. The variable winds which we feel are chiefly in the lower layers of the air.

The winds of the eddying storms are seldom destructive on the land. They are of great service in bringing most of our rainfall. On the sea and the lakes, however, they are stronger and cause many shipwrecks. The form and movement of these storms is well shown on the daily weather maps issued by the national Weather Bureau. The changes in weather which the storms produce are generally predicted. In ports, signals are hoisted to warn sailors of coming gales.

As winds become cool, cloudy and wet when they ascend mountain slopes, so they become warm, clear and dry when they descend the leeward slopes. For this reason, a mild dry wind called the *chinook* is often felt in winter on the plains along the eastern base of our northern Rocky mountains. The chinook is of great service in drying away the snow so that the cattle can find grass.

In what season is the rainfall heaviest on the western coast of the United States? Why is the rainfall of the Great Basin so light? What have you learned about the rivers and lakes of this region? *See lesson 37.*

How do you account for the light rainfall on the Western plains? *See lesson 50.* What body of water supplies most of the moisture for the rainfall of the prairies? *See lesson 51.* In what season does the greatest amount of rain fall there?

The northern part of the western coast is well watered, for it is one of the coasts where the storms of the westerly winds come directly from the ocean to the mountainous land.

The southern part of our western coast is one of the dry regions where the westerly winds branch towards the trade winds.

The western interior of our country generally has less than twenty inches of rainfall in a year, except on the mountains. Agriculture in much of this region is therefore uncertain, unless aided by irrigation. The northern part has the most rainfall. *See charts D and E.*

Over the eastern half of our country, the yearly rainfall is everywhere more than twenty inches. It is least along the border of the dry Western plains, and thence increases to over fifty inches towards the sea on the south and east. The rainfall is heaviest where the moist winds from over the warm gulf of Mexico blow ashore on the Southern coastal plain, and also where they ascend the Carolina highland.

One great advantage in the climate of the eastern half of our country is the even distribution of its rainfall throughout the year. There is no long dry season, and droughts are seldom severe enough to cause great loss.

Far inland where the rainfall is least, more than half the rain falls in the warm season when it is most needed.

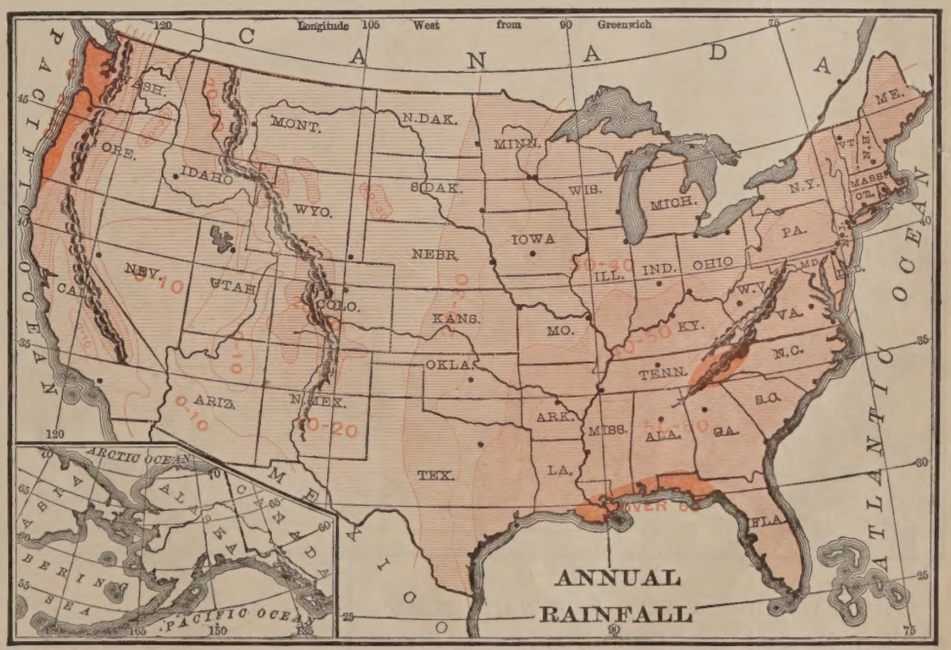
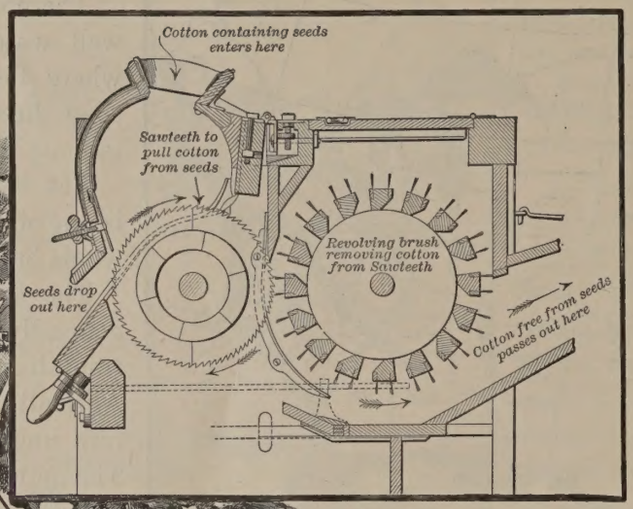


CHART E. — The regions of heaviest rainfall are in the eastern half of our country and near the northwestern coast. The mountains have more rainfall than the lower lands in the same region.

In Florida the rainfall is greatest in summer, when the sea-winds blow toward the warm land. In winter the winds tend to flow outward from the cold interior. The rainfall of our eastern coast is therefore doubly unlike that of the western coast. On the former, the amount decreases from south to north, with the heaviest rains in summer. On the western coast, the amount of rainfall increases from south to north, with the heaviest rains in winter. *See charts D and E.*


Cotton containing seeds enters here
Sawteeth to pull cotton from seeds
Revolving brush removing cotton from Sawteeth
Seeds drop out here
Cotton free from seeds passes out here

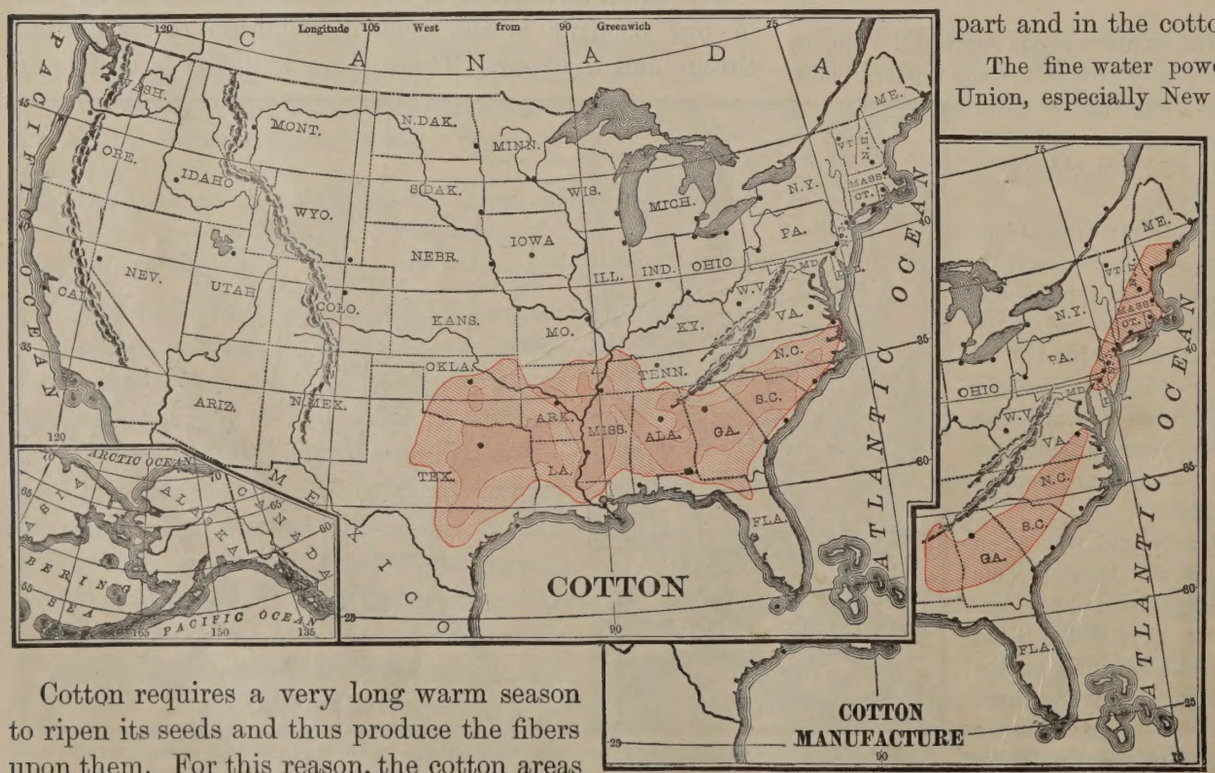
Cotton Gin.

129. Cotton.[1]

What lands that we have studied produce cotton? *See lessons 53, 54, 73 and 88.* Which heat belt crosses each of those lands? Is it a wet or a dry country?

Where is the cotton belt of the United States? Describe its surface. What regions are partly included in the tinted area of the *Cotton* map? What are the seasons of this cotton belt? From over what part of the sea do its rain-bearing winds blow?

Name some of the other products of the cotton district of our country. *See lessons 53 and 54.* Tell some of the uses of cotton.



Cotton requires a very long warm season to ripen its seeds and thus produce the fibers upon them. For this reason, the cotton areas are found in the hot and the warm belts, but only in the parts having plentiful rains.

[1] The reddish tint on the above *Cotton* map outlines the district known as the *cotton belt* of the United States. The darker the tint, the larger the yield.

The best grade of cotton is known as *Sea-island* cotton. It has long and strong fibers. It is raised in southern Georgia, northern Florida and eastern South Carolina. Most of the Sea-island cotton is sent to the mills of England, to be woven into cloth.

After cotton is picked from the plants, it is put into cotton gins to separate the fibers from the seeds. The fibers are then pressed into bales and are ready for market. This is the *raw cotton* from which thread and cloth are made.

A valuable oil is pressed from the seeds of cotton. This is known as *cotton-seed oil.* It is used in making soap and other articles. Much of the oil is refined and sold under the name of "olive oil," but the real olive oil is made from the olive fruit.

The *oil-cake* which remains after the oil is pressed from cotton seeds is fed to cattle.

Texas, Mississippi and Georgia lead all other states in the quantity of cotton produced. The chief ports through which cotton is sent to foreign lands are New Orleans and New York. Most of it goes to England, Germany and France.

Savannah, Ga.; Galveston, Tex.; Norfolk, Va.; and Charleston, S. C., have a large export trade in cotton.

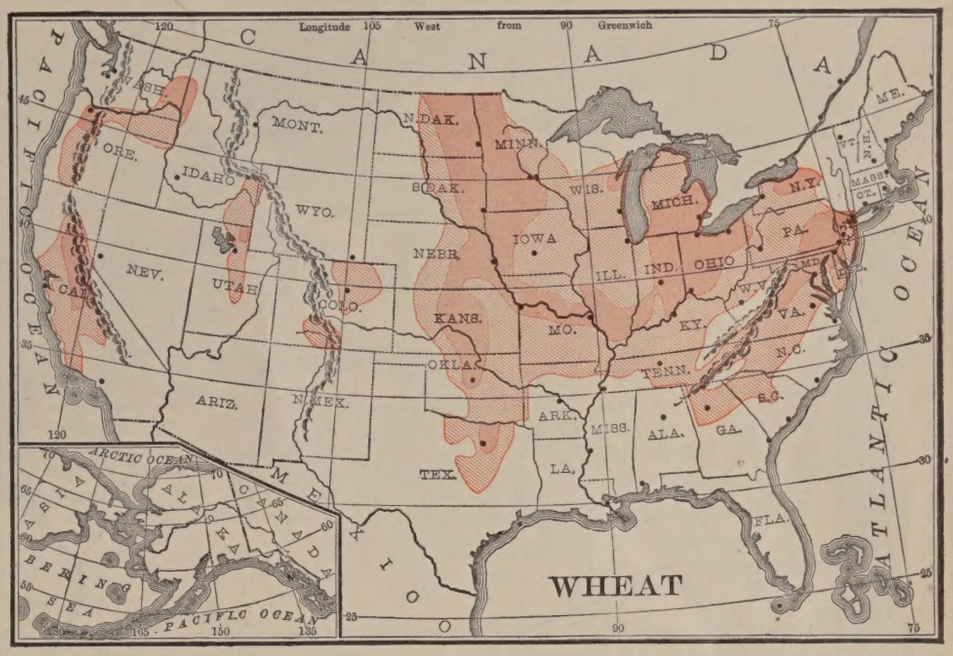
The great centers of cotton manufacture in the United States are the numerous cities and towns in the northeast part and in the cotton belt.

The fine water power gave this portion of the Union, especially New England, an early start in manufacturing. There the rivers, when cutting through gravel beds in their valleys, have reached rocky ledges and have therefore formed falls or rapids. *See lesson 45.* Steam has now largely taken the place of water power, but hundreds of mills with their skilled workmen and costly looms still hold the cloth-making industry chiefly to this district.

Fall River and Lowell (*see map, page 143*) make more cotton cloth than any other two cities in America. New York and Boston handle much of the raw cotton used in the great cloth-making states. Many cotton mills are now running in the cities of the South, and the outlook is very bright for a thriving industry there.

The United States ranks first in the production and export of cotton. About one third of the crop is used in the mills of our own country, but raw cotton to the value of about $250,000,000 is exported annually from the United States. Three fifths of the quantity go to the mills of Great Britain. A large part of the rest goes to Germany and France. India[1] and Egypt send large amounts to European countries.

England leads in the manufacture of cotton cloth. The United States holds second place, and Germany third. Our country imports fine grades of cotton cloth from England, Germany and France.



130. Wheat.

There are several kinds of wheat. Some thrive in scanty soil; others, in deep alluvial soil. Some grow best in hot lands; others, in cooler climates. For this reason, wheat is a wide-spread grain. It has been cultivated from the earliest times, and is thought to be native to Asia.

The wheat seed consists of a grain inside a thin husk. The inner part of the grain is used in making fine white flour, but the entire grain makes wholesome though darker flour.

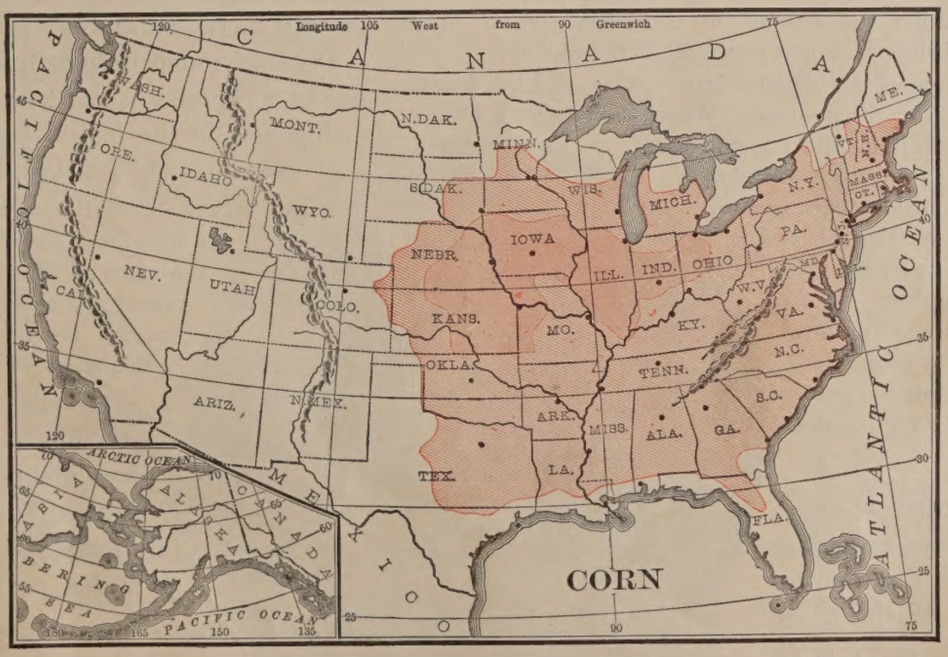
Wheat is hardier than corn, — not being so easily injured by frost or by cool weather. For this reason the cooler prairies, extending far northward even into Canada, yield immense crops of wheat but scarcely any corn. Moreover, wheat thrives in the warmer prairies and is a valuable product as far south as Texas.

Among the best wheat regions in our country are the following: the northern prairies in Minnesota and the Dakotas; the district lying between the Ohio river and the Great Lakes and stretching southwest into Kansas; the valley of California; the states between lake Erie and the mouth of Chesapeake bay.

Minneapolis has the largest flour mills in the world. Among American cities, St. Louis ranks next to Minneapolis in the production of flour. Along the water way of the Great Lakes, the Erie canal and the Hudson river, — from Chicago to New York, — every great city has extensive flouring mills. Chicago and the other large lake ports handle hundreds of shiploads of wheat each year. The wheat crop of the valley of California, either in the form of grain or of flour, passes chiefly through San Francisco; and this city ranks second in the Union in the export of these products. New York[1] ranks first, and Baltimore third.

The United States leads the rest of the world in the production of this important cereal. France, India and Russia also produce very large crops.

Wheat and flour rank next in value to cotton as exports from the United States. Like cotton and corn, they find a foreign market chiefly in the British Isles. France and Belgium also buy many shiploads of our wheat.



131. Indian Corn.

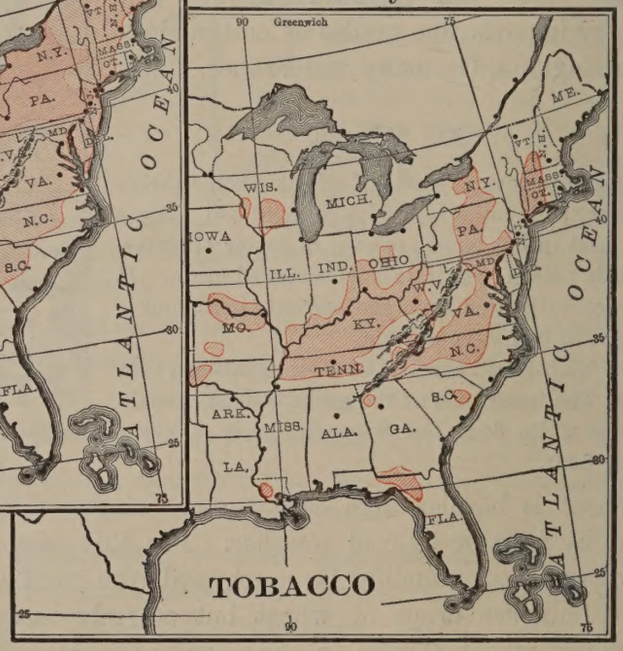
Indian corn does not thrive in places having late spring frosts or cold summer nights. The growing plant is quickly killed by frost, and cold nights greatly hinder the growth of the grain. Moreover, if the summer season is very rainy or foggy, the corn is liable to mold.

Corn is wide-spread over the eastern half of our country, except in the marshy or sandy lands along the

[1] In India, cotton cloth was made by hand for fully 2000 years before America was settled by white people.

[1] Whenever the commerce of New York is mentioned, we should not forget that Brooklyn and Jersey City form parts of the *port* of New York.

gulf of Mexico, and in the extreme north where early frosts are common or where there are dense forests. The best region for the growth of corn is in the southern half of the prairies. This corn belt stretches east and west, passing between the cities of Chicago and St. Louis. It reaches the border of the Alleghany plateau on the east and the great plains on the west.



Describe the seasons in this corn belt. What winds bring most of the rainfall to the region?

Corn meal is widely used in cooking, and is a healthful and nutritious food. When the grain is broken, hulled and boiled, it is called *hominy*. In some parts of the country, *hulled* corn and milk form a favorite dish. *Green corn*, or *sweet corn*, is often boiled on the cob and is thus used for food. A large amount of sweet corn is canned for market.

Great quantities of corn are used to fatten live stock, especially hogs and cattle. There is more live stock in the corn belt than in any other part of the United States.

Chicago and the other large lake and river ports serve as centers for the collection and distribution of corn. New York and the other great eastern seaports carry on a large foreign trade in this grain.

The United States supplies the larger part of the corn of commerce. This grain is sent chiefly to the British Isles and Germany, to help feed the millions of people in the workshops of those countries.

Corn Harvest in the Azores.

When the early white settlers came to America, they found here a new kind of grain raised by the Indians. The white men gave it the name of *Indian corn*. Since that time this valuable grain has spread to nearly all fertile lands having long and hot summer weather.

How did the Indians prepare the forest lands for cornfields? *See lesson 98.* Why was it necessary to kill the trees?

132. Oats, Barley and Rye.

Oats are not native to America and have not been so widely sown in our country as corn or wheat. In recent years, however, the crops of oats have greatly increased and are now very valuable.

Oats are much hardier than corn, — often growing in a poorer soil and a colder climate, but thriving also in the fertile prairies and still farther south in the coastal plains.

In the United States, as well as in other parts of the world, the oat crops are largest in about the same districts that produce the most wheat and corn. Nearly all the oats exported from our country are sent to England.

Barley and rye are hardy grains, but they do not take a leading place among the cereal crops of the United States. Rye is an important food-product in Russia, Germany and other parts of Europe.

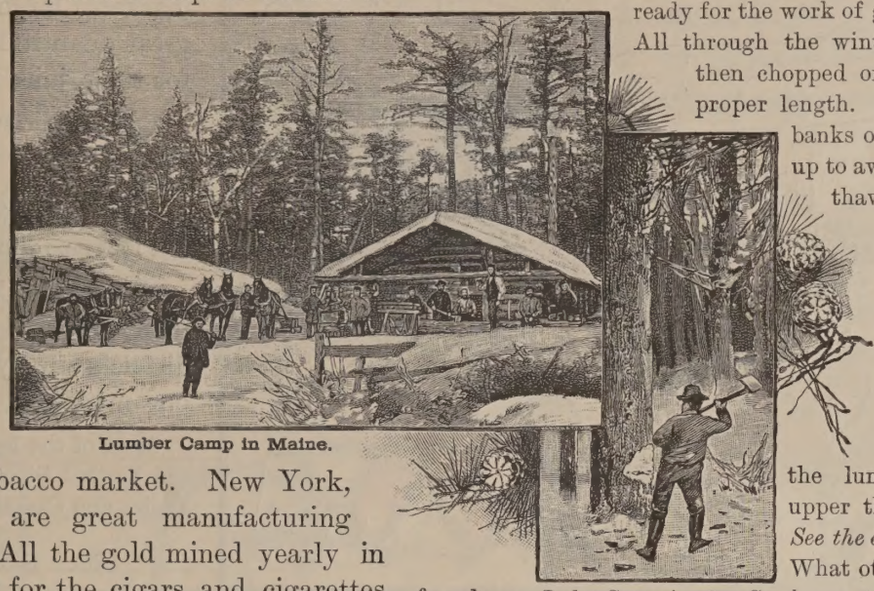
133. Tobacco.

The tobacco of commerce consists of the dried, or *cured*, leaves of several species of plants. Some of these grow to the height of six feet or more and bear large coarse leaves, on their simple upright stalks.

The most common mode of curing tobacco is as follows: The tall stalks are cut off close to the ground, and the plants are then hung up to dry on long rods in the curing houses or in the fields.

After a time the leaves are stripped from the stalks and are bound in small bundles. These are placed in heaps on the floor to ferment, or heat slowly till certain changes take place in the leaves. They are then ready to be made into cigars, snuff or other tobacco goods.

The chief tobacco districts in the United States are the Ohio river valley, the piedmont slopes east of the Blue ridge, the district crossing from lake Ontario to Chesapeake bay, and the Connecticut river valley.



Lumber Camp in Maine.

Louisville is a famous tobacco market. New York, St. Louis and Richmond are great manufacturing centers for tobacco goods. All the gold mined yearly in our country would not pay for the cigars and cigarettes made in New York alone.

The United States raises more tobacco than any other country. India, Hungary, Russia, and both the East and the West Indies supply large quantities of tobacco.

Our country has a large export trade in *leaf tobacco*. Immense quantities are sent through the ports of New York and Baltimore to the manufacturing countries of western Europe.

134. Forests.

Only a few trees grow on the Western plains or in the Basin region of our country, because the rainfall there is so light.

Large areas in the prairies are treeless, but trees grow wild in the lowlands along the rivers, and many have also been planted wherever the land is settled.

The soil in most parts of the prairies is very fine and compact. Such soil is not so well suited to forests as the looser soil of highlands or of moist sandy plains, but with care people have made countless trees thrive about their prairie homes. Fine dark soil, like that of the prairies, is found in the treeless plains of southern Russia.

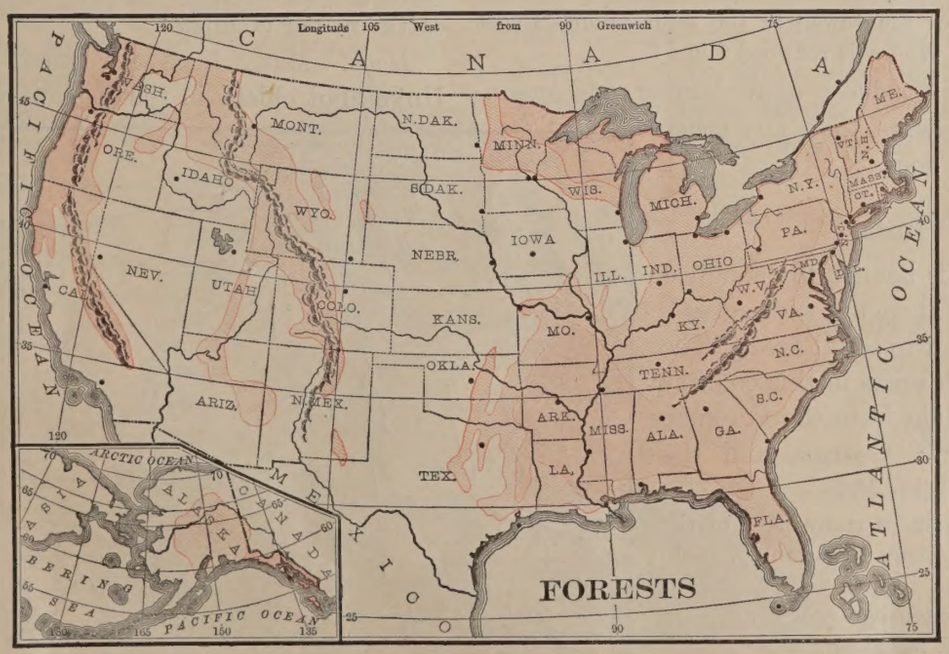
The eastern half of our country, except portions of the prairies, is quite heavily wooded and yields lumber of many kinds. The forests around the upper three of the Great Lakes consist mostly of pine, spruce and maple, but other kinds of trees also abound there.

In the autumn, bands of lumbermen go into these forests, locate camps, lay out roads, clear snags from the streams, and thus make ready for the work of getting out logs or timber. All through the winter, trees are felled and then chopped or sawed into logs of the proper length. These are hauled to the banks of streams and there piled up to await the time of the spring thawing.

When the streams are flooded and free from ice, the logs are floated down to the mills and there sawed into lumber, such as boards, joists, beams and planks.

Which states are in the lumber region around the upper three of the Great Lakes? *See the darker shading on the map.* What other valuable products are found near Lake Superior? *See lesson 49.*

Streams from this dense forest region flow to Minneapolis, and that city has grown to be a great lumber market. Hundreds of thousands of barrels are made there each year to hold the flour which the mills produce. Several branches enter the Mississippi below this city and float logs down to the mills in many other river ports.



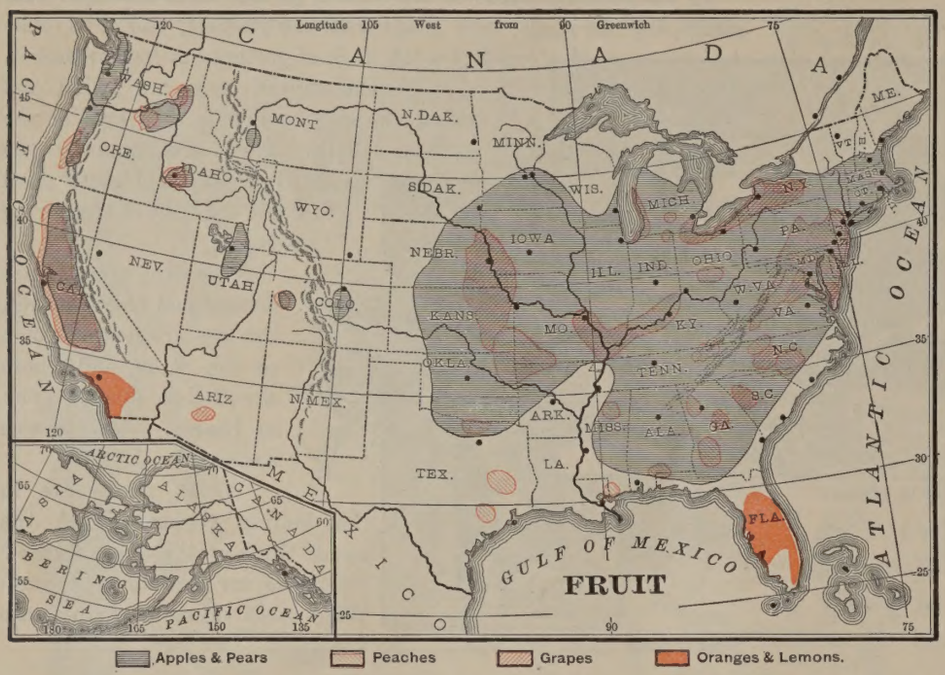
Numerous sawmills are located on the small logging rivers which flow from the forests into the Great Lakes. These mills supply lumber to the ports on the lakes. Chicago has become one of the leading lumber markets in the world.

Many cities in the lake region manufacture furniture. Among these Chicago and Grand Rapids rank highest.

The soft-wood forest belt extends eastward across New York and New England. This eastern portion has long been famous for its lumber. Bangor has grown to be a great lumber market.

This city is located on the Penobscot river, whose branches reach far into the forest area, and whose valley has been slightly drowned, making the stream as far up as Bangor navigable by large sea-going vessels.

The Appalachian highland is forested with both soft-wood and hard-wood trees. Forests of hard-wood trees abound in the states of the Ohio basin.



The hard-wood forests in the states which border on the Great Lakes have given this region the lead in the manufacture of agricultural implements, carriages and wagons.

Great forests cover a large portion of the Atlantic and Gulf coastal plains. These are perhaps the most valuable yellow-pine forests in the world. They yield not only lumber, but also turpentine, rosin and other naval stores.

What kinds of lumber are sawed in the mills around Puget sound? *See lesson 40.* Where is redwood found?

The United States produces more lumber, and manufactures more woodenware, than any other country in the world does.

135. Fruits.

The United States is bountifully supplied with fruits. Some of them are wide-spread, but others are confined to small areas. The most important peach areas in this country include the coastal plain from the Potomac river to the Hudson; Georgia and the states bordering on lake Erie.

This peach district includes many parts of the Atlantic coastal plain. There the canning, packing and shipping of fruit form a very important industry. There are extensive peach areas in California, Missouri and Michigan.

There are several well-known apple areas. One extends the entire length of the Ohio valley and for quite a distance up the Missouri valley. The districts east of lake Michigan and southeast of lake Erie are famous for this fruit. It abounds also in all the states eastward to Maine. Pears have about the same range as apples.

Large quantities of grapes grow along the southern shore of lake Erie and in the Mohawk valley. This fruit is sold mostly in boxes to the people in the great eastern cities. The grapes of California are marketed largely in the form of raisins, but great quantities of the grapes are pressed for their juice which is made into wine.

Raisins are sun-dried grapes. The curing of the fruit requires very hot and dry weather. A few days of rain in the curing season may spoil a year's crop. California is noted both for its raisins and its grape wines.

Southern California and Florida have many orange and lemon groves. These districts supply the best oranges found in our markets.

Most of the lemons and oranges imported into the United States come from Italy. The West Indies and Central America supply bananas.

136. Horses, Mules and Hogs.

Horses and Mules. Horses were first brought to America by Spanish explorers. These useful animals are now raised in nearly all grassy portions of the New World. Mules also are common in most parts of America, but chiefly in the warmer regions.

Horses and mules are raised in greatest numbers in the most fertile districts, where there is work for them on the farms. There are about one third as many horses as cattle in our country.

Hogs. Many hogs are raised in every state in the Union, but chiefly in the districts which produce the most

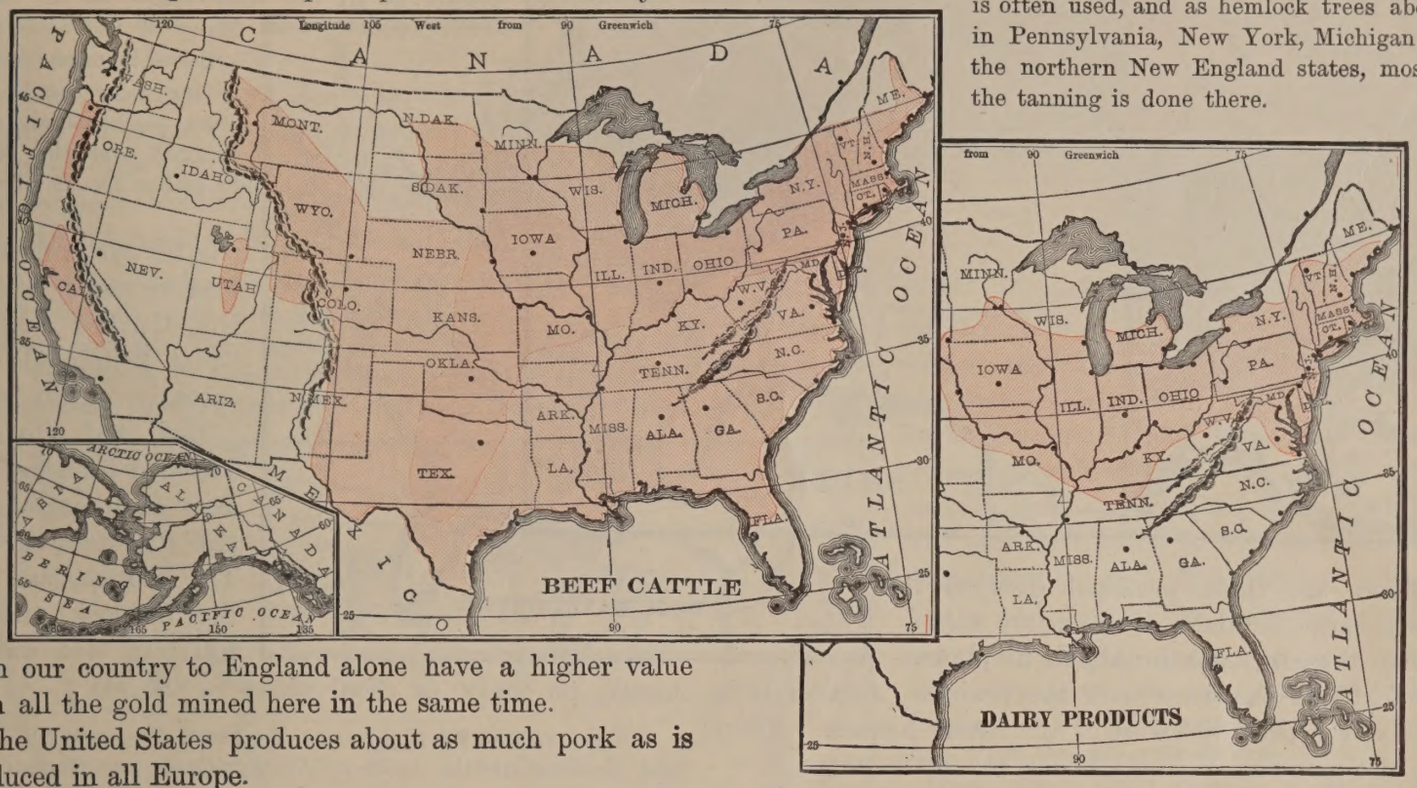
corn. This grain is the best fattening-food for swine. Millions of bushels are used yearly for that purpose.

The principal pork-packing centers are the cities of the prairies, especially Chicago and Kansas City (Kansas).

Immense quantities of pork, bacon and lard are sent abroad, chiefly to England, Germany and other countries of western Europe. The pork products sent each year from our country to England alone have a higher value than all the gold mined here in the same time.

The United States produces about as much pork as is produced in all Europe.

The hides of cattle are tanned and changed into leather. One part of the tanning process consists in soaking the hides in water in which certain kinds of bark have been steeped. Hemlock bark is often used, and as hemlock trees abound in Pennsylvania, New York, Michigan and the northern New England states, most of the tanning is done there.



What are some of the articles made of leather?

More boots and shoes are made in Massachusetts than in any other state, and Boston therefore is a leading leather market. Philadelphia deals largely in leather.

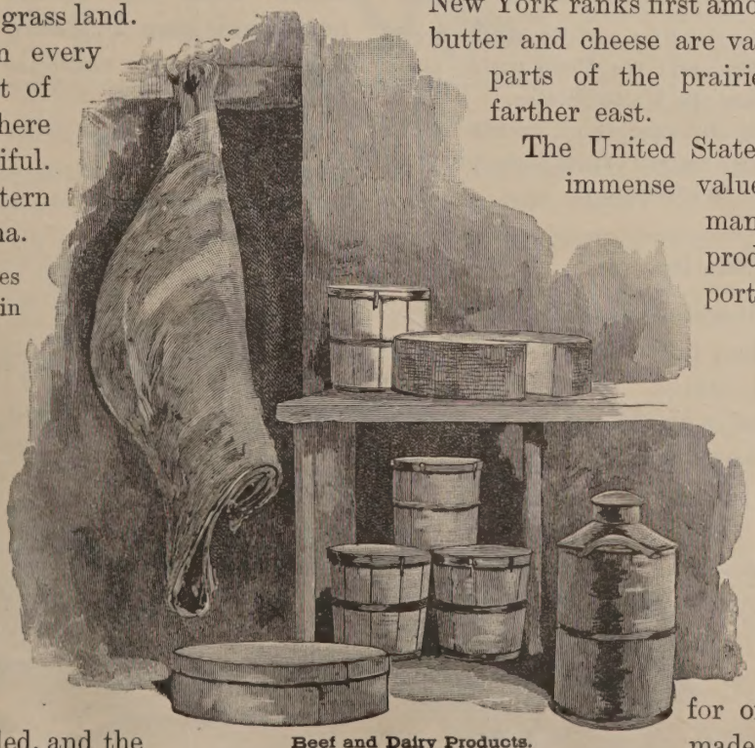
137. Cattle and Dairy Products.

Cattle are not native to any part of America, but they now thrive in great numbers on the prairies, the Western plains, the pampas, the campos and the llanos, — in short, wherever there is good grass land.

There are many cattle in every state in the Union, but most of them are on the prairies, where grass and corn are plentiful. Large herds graze on the Western plains, from Texas to Montana.

The great state of Texas raises more cattle than any other state in our country. Illinois ranks second; but in proportion to size, this state ranks first.

As the population of the Western plains is small, nearly all the cattle raised in that region are sent to the cities farther east, — to Chicago and Kansas City (Kansas), where the beef is dressed for market. The prairies are more thickly settled, and the cattle of that portion of the country are therefore mostly used near the places where they are raised. Chicago has grown to be the largest meat-market in the world.[1]



Beef and Dairy Products.

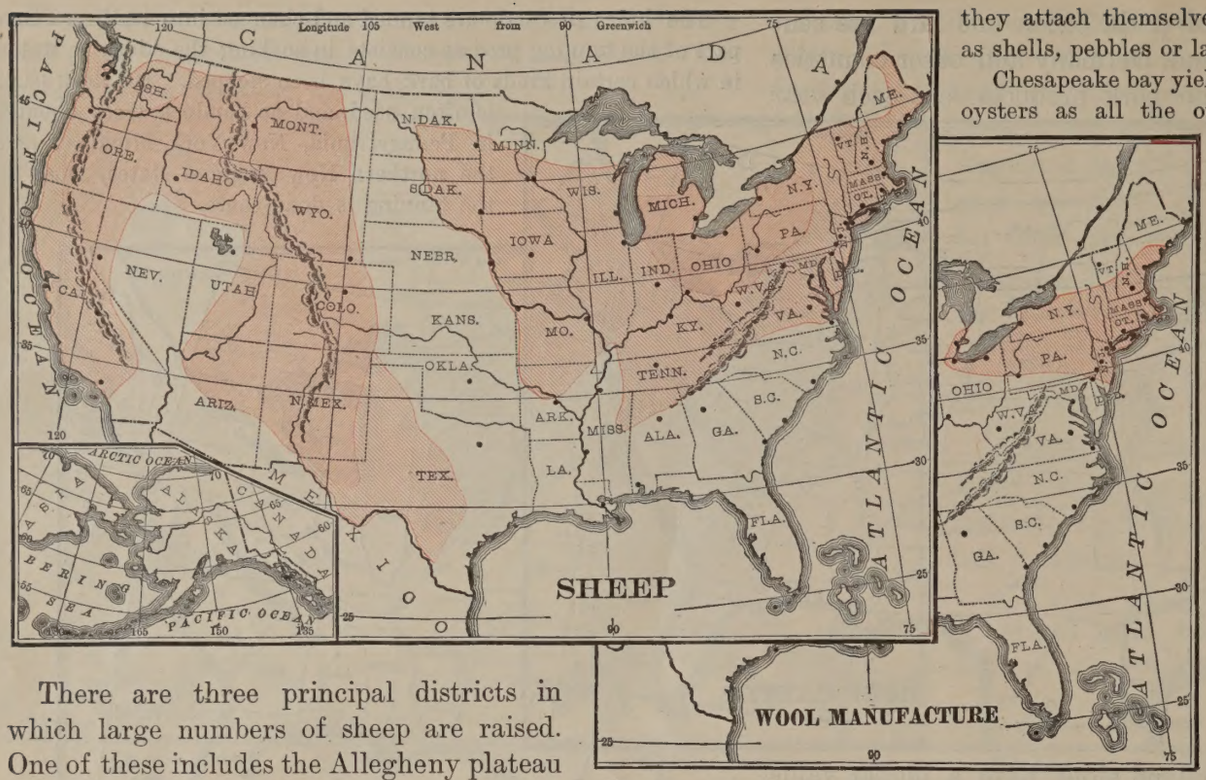
Butter, cheese and milk are known as *dairy products*. New York ranks first among the dairy states; but milk, butter and cheese are valuable products in nearly all parts of the prairies, as well as in the states farther east.

The United States exports beef and cattle of immense value to Great Britain and Germany. Large quantities of dairy products and leather also are exported to the same countries.

138. Sheep.

Wool ranks in value and usefulness next to cotton as a cloth-making fiber, but in our country more woolen than cotton cloth is made. All the gold and silver ore mined each year in the United States would not pay for one third of the woolen cloth made here in the same time.

[1] The meat products of this city have a value of about $200,000,000 a year, — or twice the value of the yearly output of gold and silver in our entire country.



There are three principal districts in which large numbers of sheep are raised. One of these includes the Allegheny plateau and extends westward over the prairies; another is in Texas; the third lies west of the Sierra Nevada. There are also many sheep in the Rocky mountain states.

In our country most of the woolen mills, as well as the cotton mills, are in New England, New York and Pennsylvania.

Boston is a great wool market, because it distributes this fiber to the mills of New England. In the manufacture of woolen carpets, Philadelphia ranks first in the world.

In the production of wool the leading regions of the world are eastern Australia and New Zealand; the Plata basin; Great Britain; the steppes of Russia; and the United States.

Our country must import wool and sheepskins, because it uses more than it produces; but the other regions export these products, — chiefly to Great Britain, France and Germany.

139. Fisheries.

Oysters. Oysters are salt-water shellfish and are the most valuable food product taken from the shore waters of the United States. The most extensive oyster fisheries in the world are carried on in Chesapeake bay. Several thousand boats and many thousand men are there employed. Smaller oyster beds are found along several other parts of the coast of our country.

Baltimore is the center of the oyster trade.

The oyster fisheries are scattered along the coast from Cape Cod to Mexico, — wherever the sea-bottom is firm. Young oysters die unless they attach themselves to hard substances, such as shells, pebbles or larger stones.

Chesapeake bay yields about four times as many oysters as all the other places on our coasts. Many of the oysters are gathered by means of tongs having long handles. In some places, dredges are dragged over the bottom to gather the shellfish.

In the oyster fisheries, France ranks next to the United States. Great Britain also has extensive oyster beds.

Cod and Haddock. The cod fisheries rank next in importance to the oyster fisheries. The codfish, and also the haddock and the halibut, are caught mostly on *banks*, or shoal places in the sea.

Off the coast of North America, the best fishing grounds for cod and haddock are the *banks of Newfoundland,* and *Georges banks* northeast of Cape Cod. The halibut is found in about the same places as the codfish. The former is the largest of flatfish and sometimes weighs a hundred pounds.

Other Fish and Shellfish. The clam and the lobster are found along the shores northward from Delaware bay. Both are valuable food products.

Mackerel migrate northward along our coasts in spring, and southward in autumn. These fish are

caught chiefly in large nets called *seines*. Eastern mackerel are taken between cape Hatteras and the gulf of St. Lawrence.

The salmon fisheries are a very important industry on the Pacific coast, northward from San Francisco bay. Fish of this kind enter the rivers to spawn, or deposit their eggs. The largest salmon canneries are near the mouth of the Columbia and along the coast of Alaska.

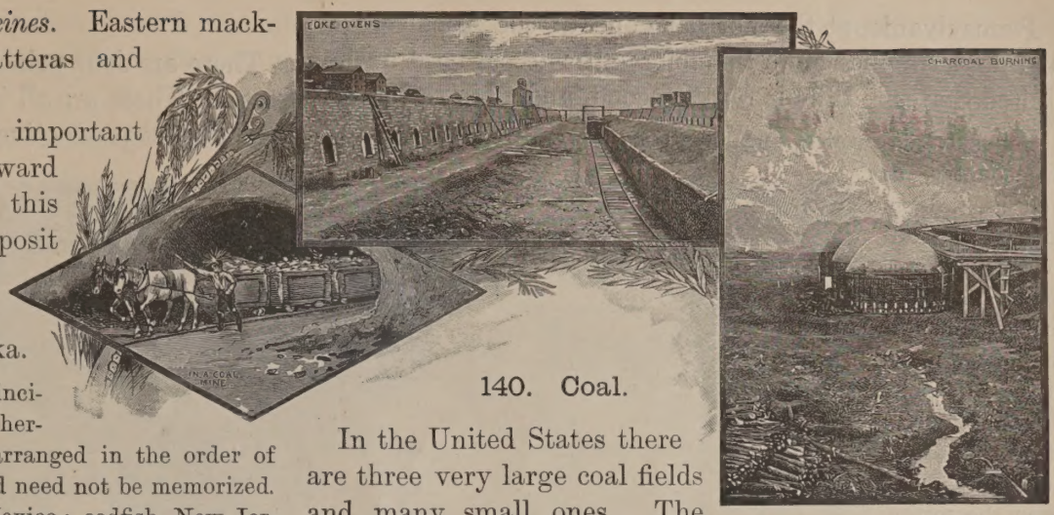
The following table shows where the principal food fishes are taken or caught by fishermen of our country. The fisheries are arranged in the order of value. The table is for *reference* only, and need not be memorized.

Atlantic coast: Oysters, Cape Cod to Mexico; codfish, New Jersey to the banks of Newfoundland; clams, Chesapeake bay to Maine; shad, Florida to Maine; lobsters, Delaware bay to New Brunswick; mackerel, cape Hatteras to gulf of St. Lawrence; haddock, same as cod; bluefish, Cape Cod to Mexico; alewives, Georgia to gulf of St. Lawrence; squeteague, Cape Cod to Mexico; crabs, Chesapeake bay to Long Island; sponges, Florida; menhaden, North Carolina to Maine; mullet, North Carolina to Mexico; herring, Marthas Vineyard to Newfoundland; striped bass, North Carolina to Rhode Island; Spanish mackerel, New York to Mexico.

Pacific coast: Salmon, San Francisco bay to Alaska; sea bass and flatfish, entire west coast of our country, except the strait of Fuca. The Pacific coast fisheries, except for salmon, have not been well developed.

Great Lakes: Whitefish, lake herring, lake trout, in all the lakes; pike perch, in lakes Ontario and Erie.

Gloucester, on the coast of Massachusetts, is the greatest fishing port in the Union.



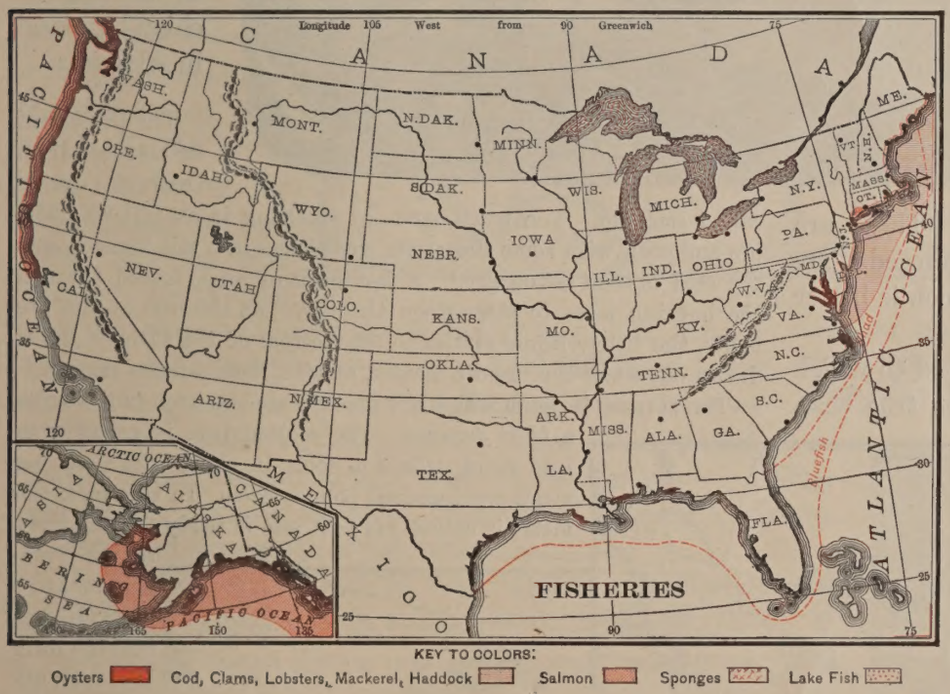
140. Coal.

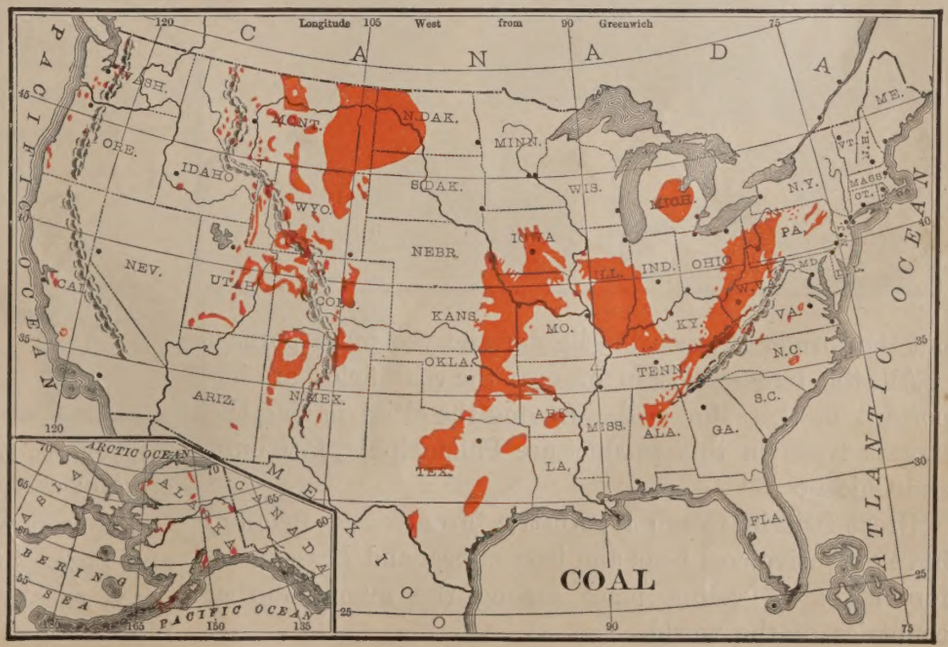
In the United States there are three very large coal fields and many small ones. The most important field extends along the Appalachian highland. The second begins not far from the head of lake Michigan and reaches slightly beyond the Ohio and Mississippi rivers. The third is west of the second, beyond the Mississippi river.

The coal beds have had a remarkable history. Each bed consists of the remains of great numbers of plants, — mostly ferns and mosses. Long ages ago, when the coal regions were lowlands, these plants grew in broad swamps. A swamp may have continued for centuries making its plant-layer thicker and thicker, until buried in sand and clay that were washed over it.

After the burial of one swamp, another formed on the cover of sand and clay. Successive swamp-layers were thus buried, one over another. When they hardened, the layers of sand became sandstone; the clay changed to slate or shale; and the swamp plants formed coal. There are generally many beds of coal in a single coal field, showing that swamps formed there many times. Some of the coal beds are only a few inches thick; others are several feet.

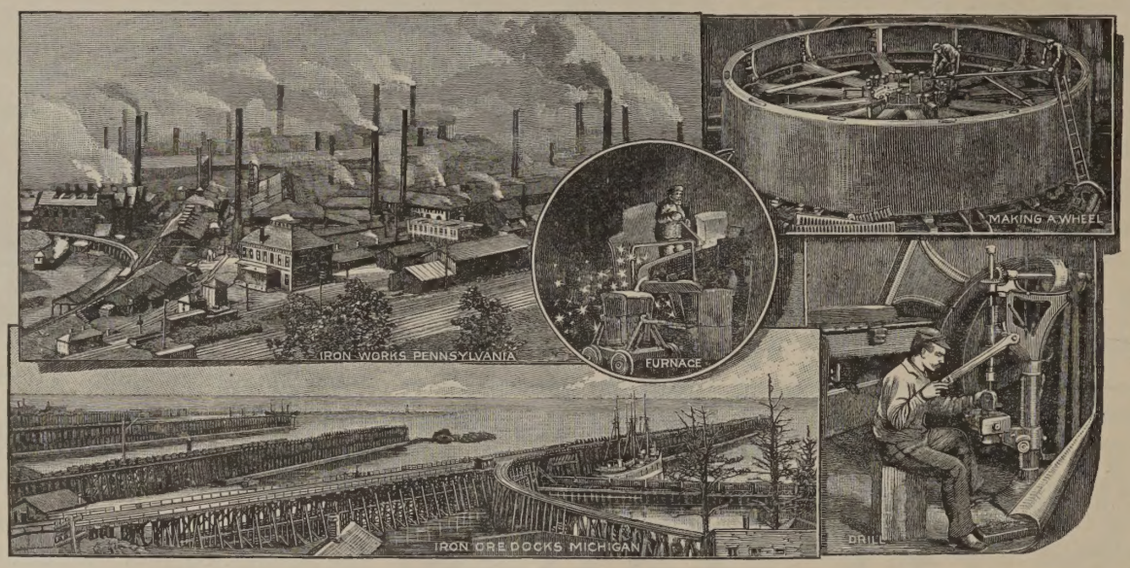
Before steam engines were invented, coal was not very valuable.





Pennsylvania, at the northern end of the Appalachian coal field, supplies more than one half the coal used in the United States. Illinois ranks second, and Ohio third.

Pennsylvania furnishes nearly all the *anthracite* coal mined in the country, as well as a large part of the soft, or *bituminous*, coal. The hard coal is found near the northern end of the Allegheny ridges. The coal of the Illinois field aided greatly in the settlement of the prairies where wood was scarce.



Large quantities of soft coal are put into ovens that shut out most of the air. These are heated till certain gases are driven off or burned. By this process the coal is changed to *coke*, which is better than soft coal for heating purposes.

Charcoal is made by burning or charring wood to which very little air has access. Charcoal resembles true coal, but the former is much the lighter and the more porous.

All the large cities in or near the coal fields are important markets for coal. Among the cities having the largest trade in this product are Philadelphia, Pittsburg and Chicago.

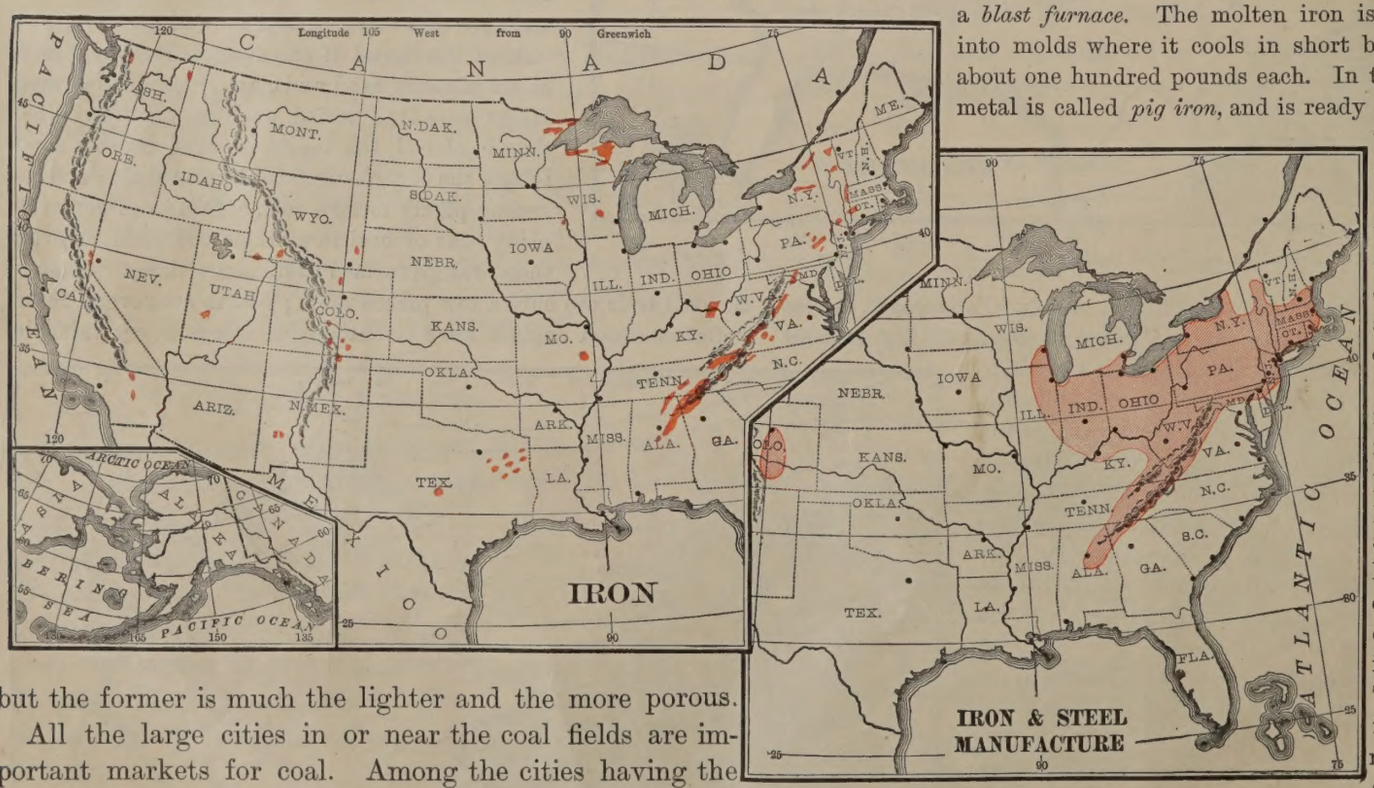
Great Britain, Germany, Austria, France and Belgium have extensive coal beds and iron mines, and have therefore taken a leading place among the manufacturing countries of the world.

141. Iron.

There are four principal iron ore districts in the United States. These are all in old worn-down mountain regions. The most productive district is near the shores of lake Superior. The other districts are the Allegheny ridges in Pennsylvania; the Adirondack mountains in New York; and the southern part of the Appalachian highland in Alabama.

The process of extracting iron from its ore is called *smelting*. The usual mode of smelting is as follows: The ore and coal, with some limestone, are placed in a tall furnace, and the coal is then set on fire.[1] A hot blast of air is forced through the burning mass to strengthen the fire. As the iron of the ore melts, the heavy liquid settles to the bottom of the furnace and is drawn off, while the impure matter, or *slag*, floats on the surface.

The furnace through which the blast of air is driven is known as a *blast furnace*. The molten iron is usually run into molds where it cools in short bars weighing about one hundred pounds each. In this form the metal is called *pig iron*, and is ready for shipment to the foundries where it may be cast into the form of stoves, hydrants, posts and scores of other objects. Iron that is to be used for certain purposes is put through a series of heating processes which change it into steel. This is used in making rails, engines, steamships, cutlery, tools and other articles that must withstand a great deal of wear and strain, or that must take keen edges.



The iron ore of the lake Superior district is plentiful and pure. It is therefore so valuable that it competes

[1] In Pittsburg and some other cities, natural gas is used for fuel. Limestone mixed with the iron ore causes it to *fuse*, or melt, more quickly.

with the iron ores in the other districts, even though heavy freight charges must be paid to transport it great distances.

Most of the lake Superior ore is carried by steamers to the various lake ports, but part is sent by rail. The lake ports use only about one third of the ore in their own manufactures. The rest is sent to inland cities, mostly in the states which border on the Great Lakes.

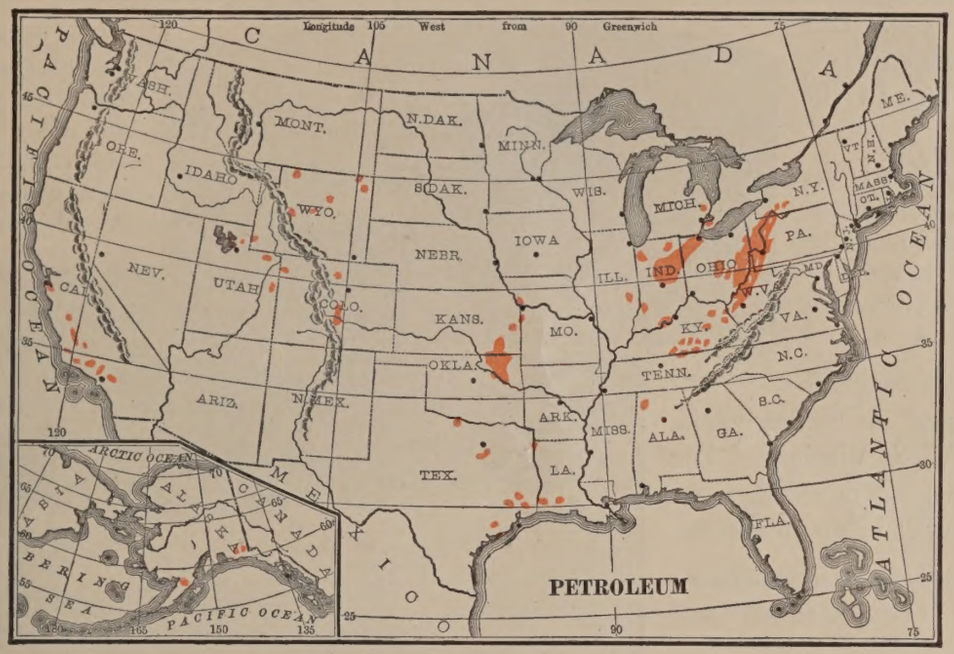
A picture on the opposite page shows some of the great docks built for shipping ore from the lake Superior district.

The principal iron manufacturing centers are in the northeast quarter of the Union, near the coal fields and the iron mines. Pittsburg and the cities near by form the most important district. Chicago and other lake ports, as well as Philadelphia and the other great seaports of the Atlantic coast, have extensive iron mills and foundries. These cities manufacture almost every kind of article made of iron or steel. Among the leading articles are rails, locomotives, boilers, hardware, cutlery, and armor plates for steamships.

The United States leads all other nations in the production of iron ore. Great Britain ranks second; Germany, third.

The United States exports iron goods to Cuba, Mexico and other American countries, as well as to England.

Large quantities of tinned iron, cutlery, rails and other steel or iron goods are imported into our country from Great Britain and Germany.

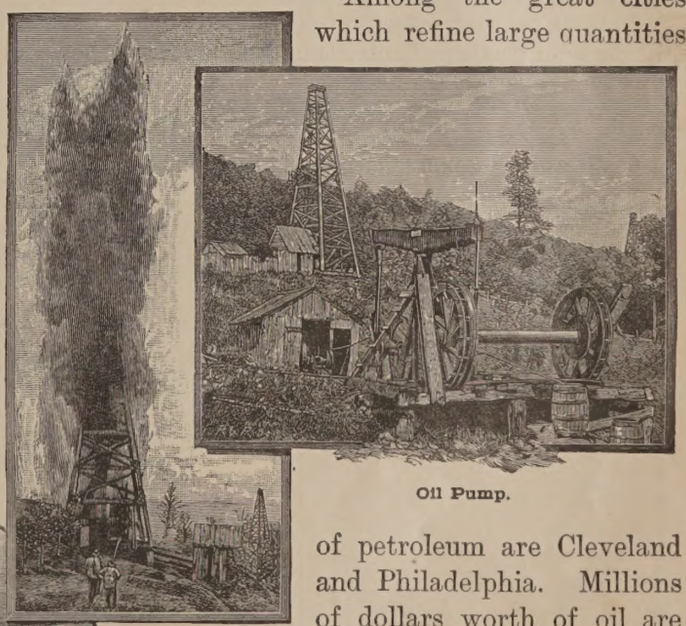


When petroleum is heated, it gives off successive vapors as the liquid becomes hotter and hotter. These vapors are condensed and then form gasoline, naphtha, benzine, kerosene, and other useful liquids. Vaseline is made from the residue left in the vats after heating. Lubricating oils and paraffin are valuable products of petroleum.

There are two well-known oil fields in the world,—one in the region of the Caucasus mountains; the other in the northern portion of the Alleghany plateau and still farther westward in Ohio. The American oil region is situated mainly in the upper Ohio basin. Of late Texas has become a very rich oil field.

Pennsylvania, Texas, Ohio and West Virginia lead the other states in the production of crude oil. More than seven eighths of the oil-yield of the Union comes from these states. New York, Colorado and California have valuable wells.

Among the great cities which refine large quantities of petroleum are Cleveland and Philadelphia. Millions of dollars worth of oil are sent each year to the countries of western Europe and southeast Asia, mostly through the ports of New York and Philadelphia.

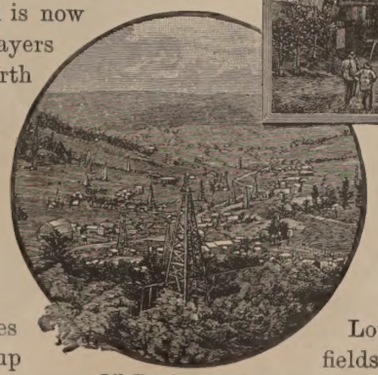


Oil Pump.

142. Petroleum and Natural Gas.

Crude petroleum comes in a liquid state from the ground.

Petroleum is thought to result from the decomposition of plants and animals buried ages ago in the rock layers. The oil is now reached by sinking pipes down to the oil-bearing layers of porous rock. Some of these pipe-wells are a fourth of a mile in depth. Thousands of wells have been sunk, but many of these no longer yield oil. Others yield a few barrels a day. The average flow is perhaps from fifty to seventy-five barrels daily; but from some wells many thousand barrels of oil have flowed in a single day.



Oil Region, Pa.

When the natural flow of a well ceases, oil is often obtained by pumping. Nitroglycerin is sometimes exploded at the bottom of the wells. This breaks up the porous rock and in many instances causes the oil to flow very freely, although at times the wells are ruined by the explosion. One of the pictures shows a "shot well" at the moment of the explosion. A great column of oil is thrown into the air.

A Shot Well.

Long pipes have been laid from the tanks in the oil fields to the cities in which the petroleum is refined. Some of these pipes are hundreds of miles in length. The oil is sent through them by means of powerful force pumps.

A large amount of oil is transported in great tanks placed on cars. Much of it is also shipped in bulk in barges or steamers.

The petroleum exported each year from the United States is of greater value than the gold mined here in the same time. Great Britain, France, Germany, Japan and India are among the best customers for American oil.

In the oil fields, and extending somewhat beyond their limits, is found *natural gas*. This gas, like the petroleum, is obtained by sinking pipes in the ground.

Natural gas in the ground is not stored in caves or other great cavities, but in porous rock, such as sandstone or limestone. Layers of shale, or clay rock, over the porous rock prevent the gas from escaping.

The most valuable gas wells in the United States are in Pennsylvania, Indiana, Ohio and West Virginia. The low cost of natural gas has in recent years caused very rapid growth in manufactures.

Natural gas is used chiefly for heating purposes. The gas can be regulated to give strong and steady heat, and this fuel is therefore of great value in iron mills and glass-works. It is also used as fuel in dwellings near the gas regions.

Many of the wells which once gave out gas under great pressure have now run out. Others are fast becoming weak. Still others have been flowing for years.

Natural gas and petroleum doubtless have a common origin in the decay of plants and animals in ancient rock layers.

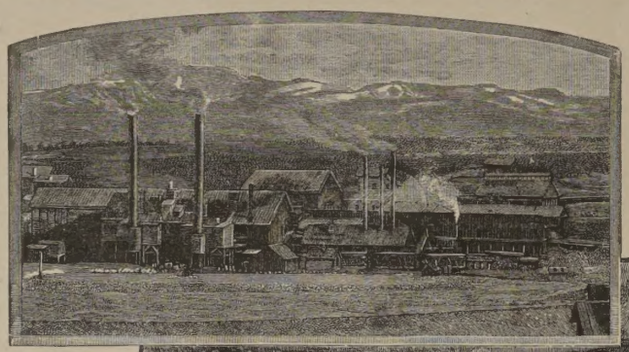
143. Gold and Silver.

Gold and silver are called *precious metals*, but they are not nearly so useful as iron. The value of the precious metals is largely due to their scarcity.

Which of the coins of the United States are made of gold? Which are made of silver? Name some other uses of gold and of silver.

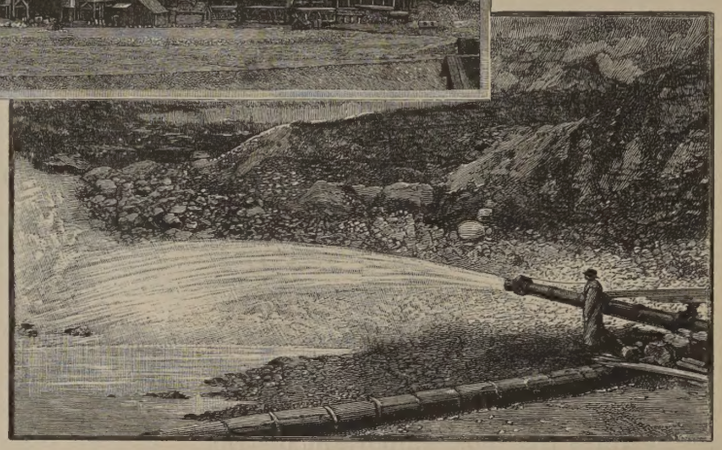
What have you learned about the gold-bearing gravels of California? *See lesson 35.*

Gold is found pure in nature. It is most often taken from veins of quartz rock or from old river gravels formed largely of the washings of quartz veins.



Smeltery.

Gold is separated from quartz by crushing the rock and then mixing the mass with quicksilver and water. The gold and quicksilver soon unite with each other. The *amalgam*, or compound of the two metals, is heated and the quicksilver is thus driven off, leaving the gold. One of the pictures on this page shows a *smeltery* where work of this kind is done.



Hydraulic Mining.

Another picture shows how a stream of water may be used to wear down gold-bearing gravel beds. Such work is known as *hydraulic mining*. The gravel, and the gold which it contains, are washed into a long trough, as described in lesson 35.

The richest gold fields in the world are the western highland in our country; the mountains of southeast Australia; South Africa; and Siberia. In recent years rich gold deposits have been found in Alaska and northwest Canada.

Colorado leads the other American states in the quantity of gold mined. California, Montana, Nevada and South Dakota also take high rank in the production of this precious metal.

Silver is rarely found in a pure state, but is almost always combined with other mineral substances.

America supplies most of the silver used in the world. Until recent years, the chief sources of silver ore were Mexico and the middle Andes, — in Peru, Bolivia and Chile. These countries still yield large amounts of the metal.

Colorado, Montana and the states in the Great Basin take the highest rank in the production of silver ore. About two thirds of the ore mined in our country are taken from the Rocky mountains of Colorado and Montana.

In prosperous mining years the output of gold and silver in the United States amounts to about $100,000,000, — equal to the cost of the Suez canal. This amount, however, is far less than the value of either the corn, the wheat or the cotton raised in our country. The value of the silver is about

twice as great as that of the gold. San Francisco and Denver owe their early growth largely to their nearness to rich deposits of gold and of silver ore.

144. Copper and Other Metals.

The United States leads all other countries in the production of copper. The most valuable mines are in Montana, Michigan and Arizona.

Iron is the only metal more useful than copper. The latter is often mixed with other metals to form *alloys*. These are of greater service than pure copper. Thus, bronze and bell metal are made of copper and tin. Brass consists of copper and zinc. Copper is often mixed with gold and silver to make the precious metals more durable, especially in the form of coins and jewelry.

Spain, Chile and Germany produce copper in large amounts. England purchases about one half of the copper mined in the United States.

Lead and Zinc. Most of the lead produced in our country comes from ores of silver mined in the Rocky mountains of Colorado and Idaho.

Large quantities of zinc and lead are obtained from ores in the Mississippi valley, especially in Illinois, Missouri and Kansas.

The United States and Germany lead in the output of lead and zinc.

Tin. Very little tin is mined in the United States. About one half of the world's supply comes from the Malay peninsula. Other important sources of tin are Banca and Billiton, two small islands east of Sumatra; Cornwall, in southwest England; and southeast Australia. Singapore, an island port near the southern end of the Malay peninsula, exports more tin than any other city in the world. England supplies our country with the *tinned iron* of which *tinware* is made.

145. Building Stone.

The various kinds of building stone quarried each year in our country greatly exceed in value the gold which is mined here. The granite alone is worth almost one half as much as the gold. The states which rank highest in the production of stone are those in the most thickly settled portion of the country, where it is most needed. Limestone is the most valuable building stone quarried in the United States. The principal limestone region extends in a broad belt from the New England highland to the Ozark highland. Pennsylvania and Illinois quarry the most limestone. A great deal of limestone is heated, or *burned*, to make lime.

Marble is a compact limestone of various colors and often showing beautiful veins. Vermont supplies more than half the marble quarried in the Union. Tennessee, New York and Georgia also produce large quantities of this stone.

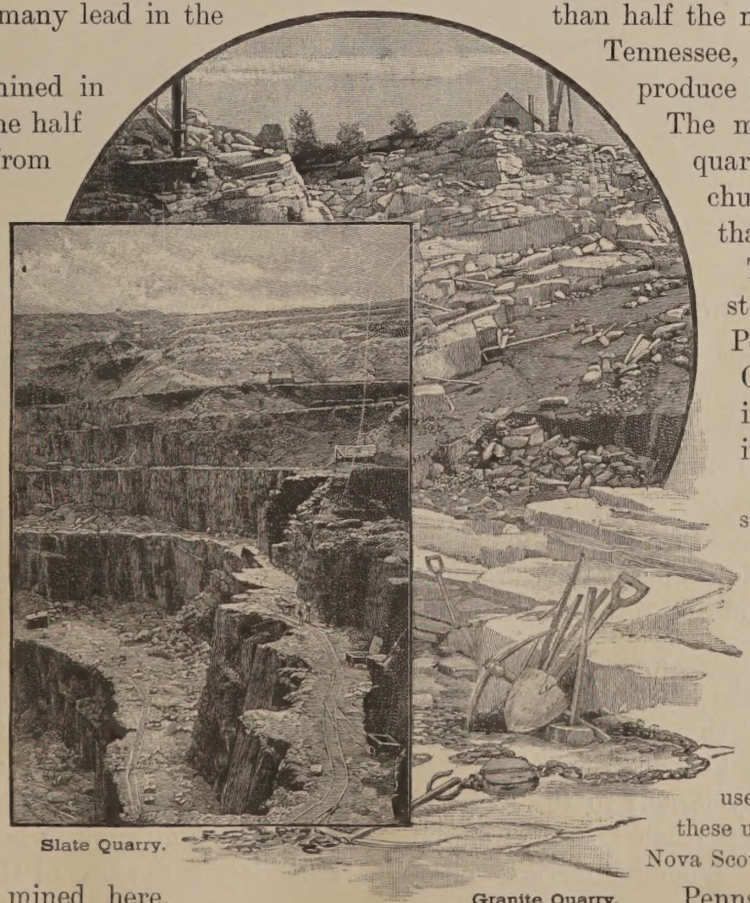
The most and the best granite is quarried in New England. Massachusetts and Maine supply more than any other two states.

The largest amount of sandstone comes from Ohio and Pennsylvania. In recent years, Colorado has taken high rank in the output of this fine building stone.

Bluestone is a variety of sandstone. This stone is formed of small grains worn mostly from quartz rock.

Bluestone is hard and durable. It is therefore useful for street work, such as paving, flagging and curbing. Most of the bluestone quarries are near the Hudson river.

The *Berea grit* of Ohio is largely used in making grindstones. Many of these useful stones are also imported from Nova Scotia.



Slate Quarry. Granite Quarry.

Pennsylvania supplies more than half the roofing and flagging slate used in our country. Vermont holds second place in the production of this stone.

146. Review and Map Studies.[1]

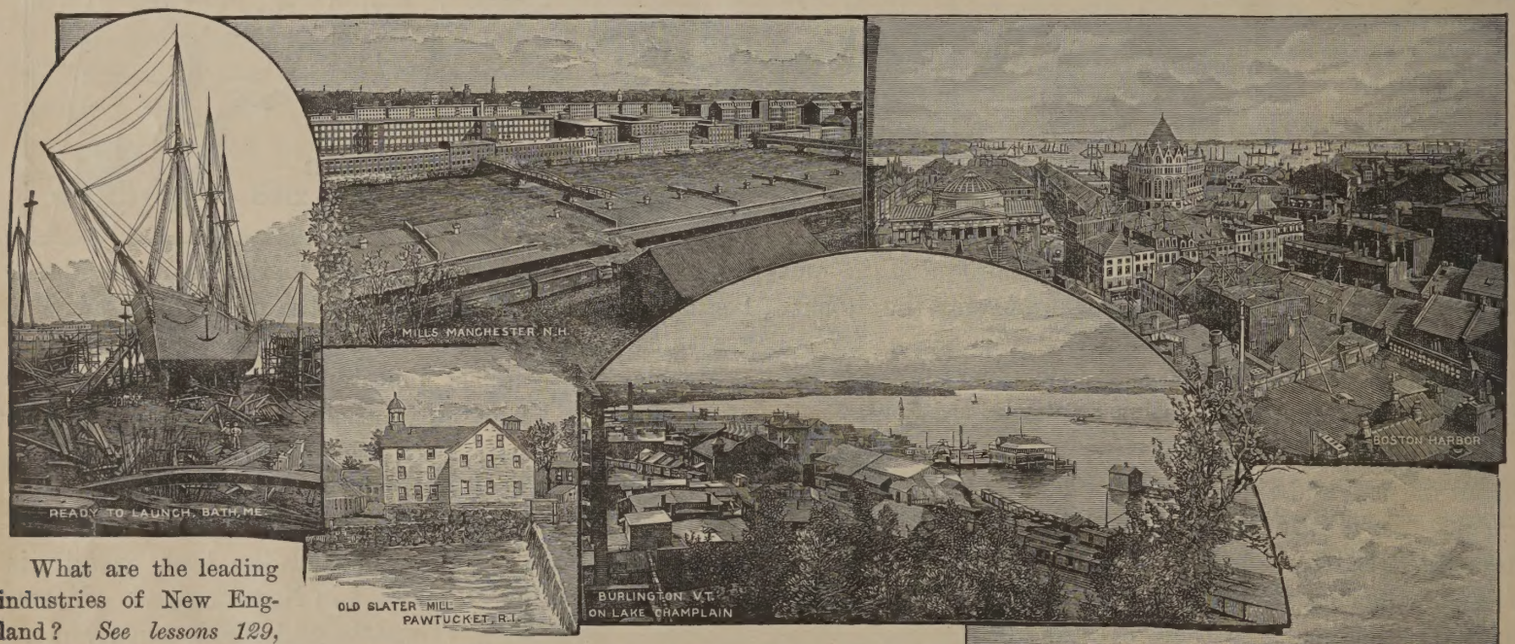
What does the corner map of the United States on the opposite page show about New England, — its position, size, etc.? Which is farther north, — Boston or Rome? — Boston or Portland (Oregon)?

What have you learned about the surface of New England? *See lesson 45.* Why are there so many lakes and falls in this region? Which of the New England states is partly in the Great Valley? *See page 46.* Where is Lake Champlain?

Locate Cape Cod peninsula; Marthas Vineyard and Nantucket; Penobscot bay; Long Island sound. Why is the seacoast so irregular? *See lesson 45.*

Describe the course of the Connecticut river. Where is the Merrimac river? — The Blackstone river?

What do the maps on pages 21, 24, 128 and 129 show about the climate of New England? Why is its climate more severe than that of the coast of Europe in the same latitude?



What are the leading industries of New England? *See lessons 129, 133, 134, 137, 139 and 145.* Locate the capitals of the New England states.

147. New England States.

Manufacturing is the principal industry in New England. In this group of states is made a large portion of the cloth, the boots and shoes, the hardware, the firearms and other goods of various kinds used in our country.

With excellent water power, deep harbors, soft-wood forests, and quarries of building stone, New England has grown rich and prosperous. No people in the world have done more for public schools and libraries than the people of New England.

MASSACHUSETTS. **Boston,** the chief trade center of New England, now has a population of more than half a million. This city is the capital of Massachusetts.

Boston owes its growth very largely to the fact that here the railroads from the west reach the chief harbor on the New England coast. Among American cities, Boston ranks second in foreign commerce. It has also a large domestic commerce.

[1] Do not forget to locate every place named in the text.

The mills and factories of New England use great quantities of cotton, wool, leather and rubber. Part of this material comes through the port of Boston.

This city distributes cloth and leather goods made in the mills and factories of this section. Shiploads of western products — such as pork, cattle and beef — are sent from this port to Europe.

Boston has excellent railroad connections with all parts of the country. The *Boston and Maine* lines spread northward; the *New York, New Haven and Hartford* railroad forms a network to New York; the *Boston and Albany,* the *Fitchburg* and other lines afford direct routes westward.

Boston, like all other great cities in our country, has extensive manufactures.[2] Among these, each of nearly fifty kinds yields products every year worth from one million to twenty-five million dollars. The most valuable manufacture is clothing.

There is a United States navy yard on Boston harbor.

Among the cities of this state, **Worcester** ranks second in size. It is a railroad center and has a great variety of manufactures.

We have learned that **Fall River** and **Lowell** manufacture more cotton cloth than any other two cities in America. It would take three fourths of all the gold mined yearly in our country to pay for the cotton goods made in Fall River alone. **Lawrence,** a little below Lowell on the Merrimac, takes high rank in both woolen and cotton goods.

Cambridge is the seat of Harvard University.

[2] The largest cities of the United States, in the order of size, are: New York (including Brooklyn), Chicago, Philadelphia, St. Louis and Boston. These cities rank in the same order in the value of their manufactures.

Lynn, Haverhill and **Brockton** lead in the manufacture of boots and shoes. The value of these products in Lynn is about equal to that of the cotton goods in Fall River.

Springfield has a United States armory, where rifles for the army and navy are made.

More paper is made in **Holyoke** than in any other American city.

MAINE. **Portland,** the largest city in Maine, is on a fine harbor and has a large coasting trade. In winter, when the St. Lawrence river is frozen over, Portland serves as a port for much of Canada's foreign trade.

Large cotton mills have been built in **Lewiston,** near falls that supply fine water power.

Bangor, at the head of tide water on the Penobscot river which flows from the Maine forest region, is a great lumber market.

NEW HAMPSHIRE. **Manchester** is one of the cities having extensive cotton mills on the Merrimac river. Locomotives also are made in this city.

Concord, the capital, is well known for the granite which is quarried in its vicinity.

Portsmouth is the only seaport on New Hampshire's few miles of coast. A United States navy yard is situated at Kittery, Maine, opposite Portsmouth. War vessels are often repaired in navy yards.

VERMONT. The small rivers flowing into lake Champlain are very useful in floating logs down to the sawmills. **Burlington** has the best harbor on this lake, and has grown to be a great lumber market. **Montpelier** is the capital.

We have learned that Vermont produces more than half the marble used in our country. **Rutland** is the center of the marble industry. **St. Albans** is noted for its dairy products; and **Barre** for its granite.

RHODE ISLAND. **Providence,** the capital and second city in size in New England, is at the head of Narragansett bay, — a partly drowned valley. This city has great woolen mills and the largest jewelry factories in the United States.

Pawtucket and **Woonsocket,** on the Blackstone river, have large cotton mills. In the old Slater mill of Pawtucket, cotton manufacturing in this country was first started in 1790. *See picture on page 142.*

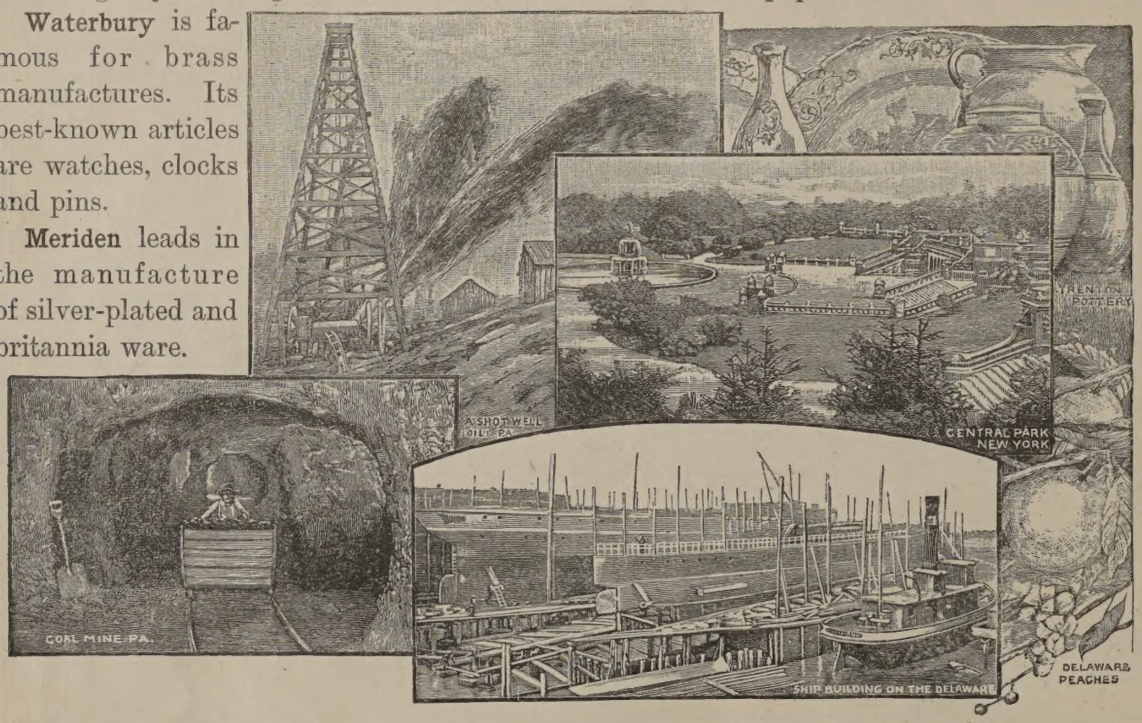
Newport, formerly a capital of the state, is a famous summer resort.

CONNECTICUT. **New Haven** is the largest railroad center and port in Connecticut, and is the seat of Yale University. This city manufactures hardware and firearms.

Hartford, the capital, is at the head of steamboat navigation on the Connecticut river. **Bridgeport** is a manufacturing city on Long Island sound.

Waterbury is famous for brass manufactures. Its best-known articles are watches, clocks and pins.

Meriden leads in the manufacture of silver-plated and britannia ware.



148. Review and Map Studies.

Which is larger, — Maine or New York? Which is farther north, — New York or Chicago? — Richmond or San Francisco?

Refer to the maps on pages 21, 24, 128 and 129, and tell what you can about the climate of these states.

Which states of this group are partly in the Atlantic coastal plain? What are some of the products of the piedmont and the coastal plain in these states? *See lessons 45, 54, 134, 135 and 139.*

Describe the Old Appalachian range in this group of states. *See lesson 45.* Describe the Great Valley. *See lesson 46.* What two branches of the Great Valley lead into the Hudson gorge?

What useful products are taken from the Allegheny ridges and plateau in this group of states? *See lessons 47 and 140.* What two rivers unite at Pittsburg to form the Ohio river?

Describe the main slopes of the land in this group of states. Of what state is Long Island a part? Locate the capitals of the Middle Atlantic states.

149. Middle Atlantic States.

The slight drowning of ancient coastal valleys has made fine harbors for New York, Philadelphia and Baltimore, — three of the greatest commercial cities of the Union. The Hudson and Mohawk valleys turn much of the western export trade to New York. Several railroad lines from east to west have been built across the Appalachian highland. This highland is rich in coal, iron ore, petroleum and natural gas. The piedmont belt yields immense crops of tobacco. The coastal plain is a leading fruit district. Chesapeake bay has valuable oyster beds.

With all these advantages, this group of states has grown wealthy, and two of its cities are among the largest three in America. New York ranks first and Philadelphia third — Chicago being second.

NEW YORK. **New York** is now the second city in population in the world. In amount of foreign trade, London alone surpasses the *port* of New York. The great seaport at the mouth of the Hudson river carries on more than half the foreign trade of our country.

The *port* of New York is connected with the interior by several trunk lines of railroad. Among these are the *New York Central* and the *Pennsylvania* systems. The former extends along the Hudson and Mohawk valleys, reaching Buffalo on Lake Erie. At Albany this line connects with the *Boston and Albany* railroad. The *Pennsylvania* line runs to Philadelphia, and thence to Pittsburg.

The chief exports from New York are meats, cotton, petroleum, wheat and flour. Most of these are sent to Great Britain and other countries of western Europe.

New York's principal imports are — cloth from England, Germany and France; coffee from Brazil and other parts of tropical America; cane sugar from the West Indies, and beet sugar from Germany; tin plate from England; rubber from Pará; tea from China and Japan.

New York is the greatest manufacturing center in America. The total value of the manufactures of this city is greater than that of all the articles of import into our country.

The great value and variety of the articles made in this city may be judged from the fact that there are more than one hundred and fifty industries, each yielding products worth from $1,000,000 to nearly $150,000,000 each year. The most important manufactures are various articles of clothing, books, cigars, leather goods and furniture.

New York and Jersey City prepare great quantities of meat for home and foreign markets.

Brooklyn, now a borough of the city of New York, contains over 1,000,000 people. Brooklyn is joined to New York proper by the largest suspension bridge in the world.

In the refining of sugar, Brooklyn ranks second only to San Francisco. The roasting and grinding of coffee and spices are important industries here, as in New York proper. Brooklyn contains a United States navy yard. It has dry docks and other facilities for shipbuilding.

Buffalo has grown to be a large city, because it has a fine harbor on Lake Erie, is at one end of the Erie canal, and is an important railroad center.

Great quantities of western products pass through Buffalo. Its principal manufactures are lumber and flour. Meat-packing is here an extensive industry.

Rochester and **Syracuse** are on the Erie canal and the New York Central railroad. Rochester has large flouring mills. Syracuse is famous for its salt-works.

Albany, the capital, is an important railroad center and is near the head of tide water in the Hudson.

The United States Military Academy is at **West Point.**

PENNSYLVANIA. **Philadelphia** has a fine harbor on the tidal portion of the Delaware river. This city is not far from rich mines of coal and of iron ore. Philadelphia therefore exports coal, and manufactures great quantities of iron and steel goods.

and many tanneries have been built there. Leather goods form one of the chief manufactures of Philadelphia.

There are great cotton mills and oil refineries in this city. Along the river front in and near Philadelphia are immense shipyards. Nearly all the new iron ships of our navy were built here.

The foreign trade of Philadelphia is very large. The city ranks third in population among American cities.

Harrisburg, on the Susquehanna, is the state capital.

One of the best sheep-raising districts in our country extends across this state and into Ohio; and Philadelphia now leads the world in making woolen carpets. There are large forests of hemlock in northern Pennsylvania.

Pittsburg's leading industry is the manufacture of iron and steel goods. Among these are locomotives, steel rails, car wheels, and armor plate for ships of war.

Excellent sand for glass-making is found in the upper Ohio valley, and Pittsburg is famous for glassware.

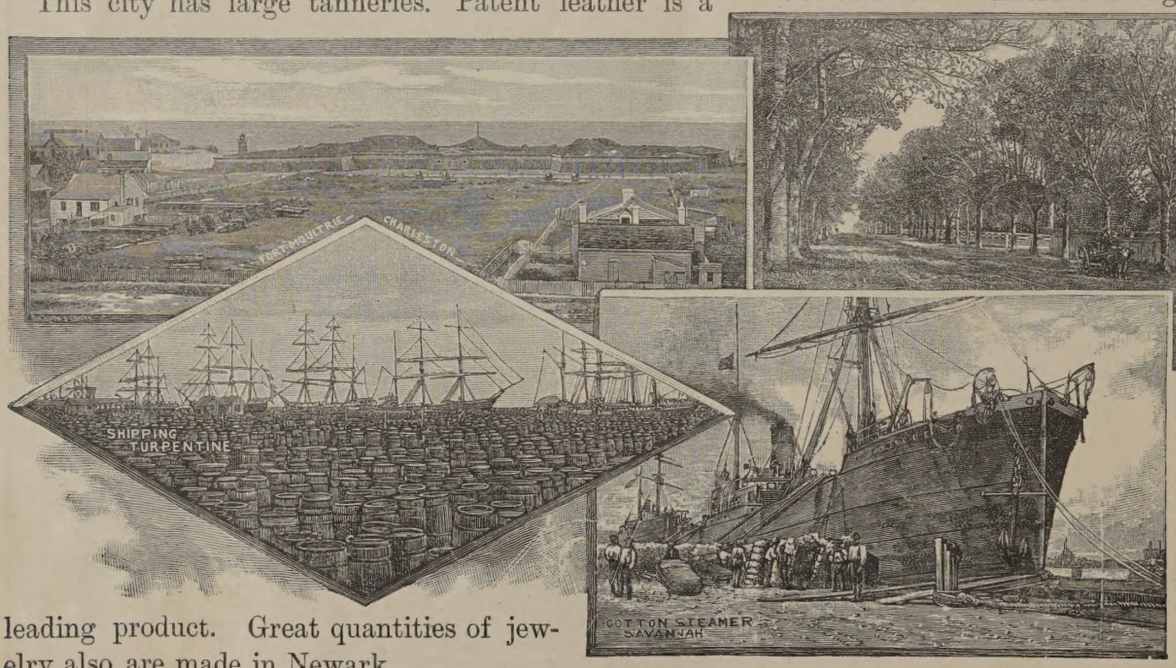
This city has a large trade in soft coal and in petroleum.

The former city of Allegheny is now a part of the great city of Pittsburg. This city has a large trade with other river ports down the Ohio.

Scranton, Reading and **Erie** have large iron works.

NEW JERSEY. **Newark,** the largest city in New Jersey, is on the line where the piedmont belt adjoins the lower coastal plain.

This city has large tanneries. Patent leather is a leading product. Great quantities of jewelry also are made in Newark.



Jersey City forms an important part of the *port* of New York. Many ocean steamers clear from the Jersey City side of the harbor, because they can there meet the freighted trains from several railroad lines that do not enter the city of New York.

Paterson has the largest silk factories in the United States. **Camden,** opposite Philadelphia, is one of the cities having shipyards on the Delaware.

Trenton, the capital, is famous for its fine pottery.

DELAWARE. **Wilmington** contains more than one third the population of the state. The chief manufactures of the city are leather and cars.

The canning and packing of fruit form the leading industry of **Dover,** the capital of Delaware.

MARYLAND. **Baltimore** is on a fine harbor not far from the head of Chesapeake bay. The foreign commerce of this city is about equal to that of Philadelphia.

Baltimore is almost surrounded by fruit districts. It is not far from the piedmont tobacco regions of Virginia and Pennsylvania. The long grain belt from Lake Ontario to Chesapeake bay includes the country around Baltimore. This bay supplies more oysters than are taken from any other equal area in the world.

With these natural advantages, Baltimore takes high rank in the canning and shipping of fruit and oysters, and in the manufacture of tobacco articles and flour.

The United States Naval Academy is located at **Annapolis,** the capital of this state.

VIRGINIA. **Richmond** ranks next to New York and St. Louis in the manufacture of tobacco articles. Richmond is also a leading market for leaf tobacco.

This city is at the head of tide water on the James, and has an active coasting trade. It is the state capital.

Norfolk, the chief port of Virginia, ships great quantities of cotton. There is a large United States navy yard on the harbor, opposite Norfolk.

Petersburg and **Lynchburg** are important tobacco markets.

WEST VIRGINIA. **Wheeling** is the center of the iron industry of the state.

West Virginia has extensive coal, oil and gas fields.

Huntington is a coal and lumber market.

Charleston is the capital.

Parkersburg has a large trade in petroleum.

150. Review and Map Studies.

If a ship were to sail due west from the strait of Gibraltar, what part of our coast would it reach? Describe the climate of this section. *See maps on pages 21, 24, 128 and 129.*

Which of the states of this group lie partly within the Atlantic coastal plain? Name two valuable products raised near the coast. *See lesson 54.* What are the leading products of the coastal plain and of the piedmont belt farther inland? *See lessons 53 and 54.*

What have you learned about the Carolina highland? *See lesson 45.* Why is the northern half of the Allegheny plateau more thickly settled than the southern half? *See lesson 47.*

Locate the state capitals in this group.

151. Southern States, — Eastern Section.

The region at the southern end of the Appalachian highland has rich mines of iron ore and of coal. The uplands of this section form one of the most productive cotton districts in the world. Corn and tobacco also abound. Many falls and rapids at the lower border of the piedmont in these states have in recent years led to the building of extensive cotton mills.

Great areas of the coastal plain are covered with forests of yellow pine which yield valuable lumber, rosin and turpentine. Among the lesser products of this section are early fruits and vegetables. The swampy coastal lowlands produce great quantities of rice.

North Carolina. **Wilmington** has a good harbor on the tidal waters of the Cape Fear river. The chief exports are cotton and tobacco from the uplands; and lumber, rosin and turpentine from the yellow-pine forests of the coastal plain.

Raleigh, the capital, is in the cotton and tobacco district, and is the leading cotton market in the state. The city was named in honor of Sir Walter Raleigh.

Charlotte is an important railroad center, and therefore a market for the products of the surrounding district.

Asheville is a beautiful mountain resort.

South Carolina. **Charleston** is the chief seaport of South Carolina. It has a fine harbor easily reached from all parts of the state.

Charleston takes high rank in the export of cotton and rice.

Near Charleston, and in the river bottoms and marshy lands farther south, is found a kind of rock known as *phosphate rock.* Large quantities of it are prepared for use as a fertilizer.

Columbia, the capital, is the railroad center of the state.

Georgia. In **Atlanta,** the capital, several railroads from the Atlantic coastal plain meet others from the Mississippi valley. This city is therefore a trade center for nearly all kinds of southern products. Atlanta has extensive cotton mills.

Savannah is on the Savannah river, eighteen miles from the sea. Only New Orleans and New York, among the seaports of our country, surpass Savannah in the export of cotton. This city has a large trade in rice, and leads the world in the export of rosin and turpentine.

Augusta, Macon and **Columbus** are not only important markets for southern products, but they also have large cotton mills.

FLORIDA. **Jacksonville** is the chief city. It is a leading port for naval stores and lumber.

Pensacola has a fine harbor and ranks high in the export of lumber. A navy yard is located near this port.

Key West is in a group of coral islands. It is noted for cigars and sponges, and is a naval station. **Tampa,** also noted for cigars, is the chief port for steamers to Cuba.

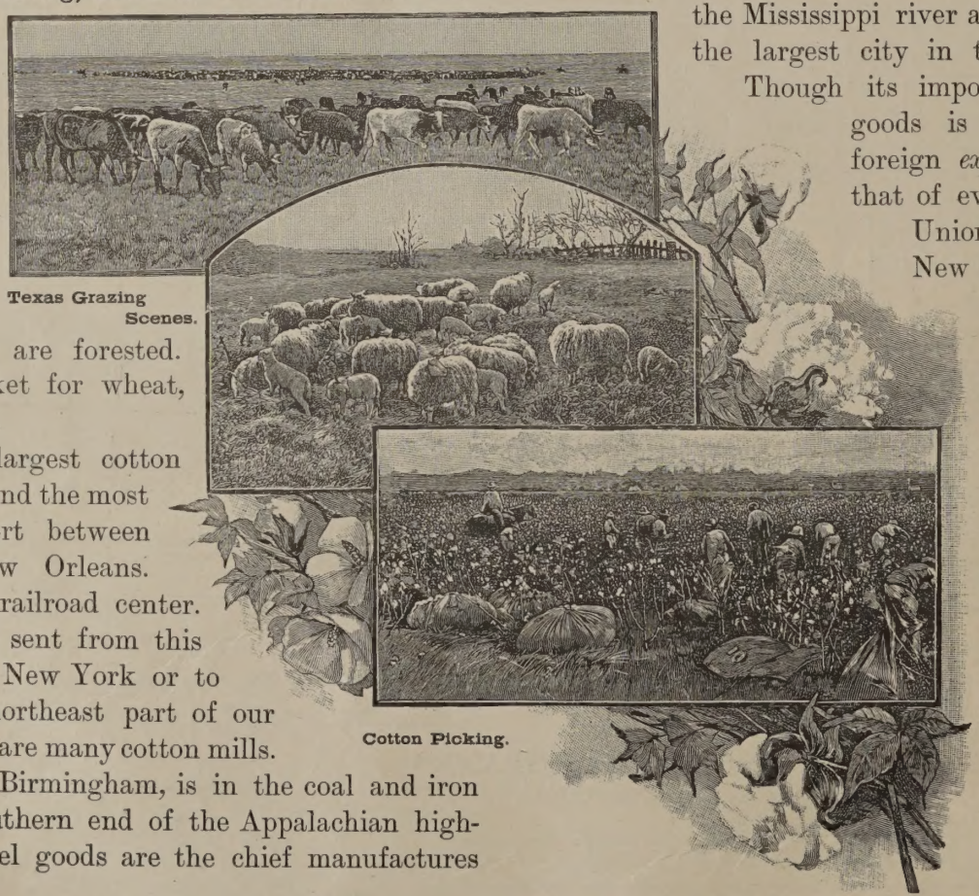
Tallahassee is the capital.

ALABAMA. **Mobile,** at the head of Mobile bay, is the principal port, and forms the outlet for a large portion of the cotton and the lumber products of the state.

Birmingham is situated in the coal and iron district near the southern end of the Appalachian highland. This city has extensive manufactures of iron and steel.

Montgomery, the capital, has a large trade in cotton.

MISSISSIPPI. **Vicksburg, Meridian** and **Natchez** are important cotton markets. **Jackson** is the capital.



Texas Grazing Scenes.

Cotton Picking.

TENNESSEE. **Nashville,** the capital, is in a region where both cotton and tobacco are produced. Large areas in Tennessee are forested. Nashville is a market for wheat, lumber and tobacco.

Memphis is the largest cotton market in the state, and the most important river port between St. Louis and New Orleans. Memphis is also a railroad center. Much of the cotton sent from this city goes by rail to New York or to other cities in the northeast part of our country, where there are many cotton mills.

Chattanooga, like Birmingham, is in the coal and iron district near the southern end of the Appalachian highland. Iron and steel goods are the chief manufactures in both these cities.

Knoxville is the trade center of northeastern Tennessee.

152. Review and Map Studies.

What two territories are in this group? Which is the larger, — Texas or New England? Which reaches farther south, — Texas or Florida? *See map on page 126.*

Describe the climate of this group of states. *See maps on pages 21, 24, 128 and 129.*

Describe the delta of the Mississippi. What have you learned about the flood plains of this river? *See lesson 53.*

What have you read about the Texas prairies? *See lesson 51.* What region is on the west of these prairies? How do you account for its dryness? *See lesson 50.*

Which part of this section is the most thickly settled? Why? *See map on page 124.* Locate the capital of each of the states in this group.

153. Southern Group, — Western Section.

The products and industries of this section resemble those of the states farther east. Rice thrives in the swamps along the coast and in the river valleys; sugar cane abounds in the flood and delta plains; forests of yellow pine and other trees cover large areas; cotton, grain and tobacco grow in abundance; large numbers of cattle and sheep graze in the western portion of the section, especially in Texas.

Among the states of our country, Texas takes first rank for cotton and cattle. Louisiana produces more sugar cane and rice than any other state.

LOUISIANA. **New Orleans** has an excellent harbor on the Mississippi river and has grown to be the largest city in the Southern states. Though its import trade in foreign goods is not large, yet its foreign *export* trade surpasses that of every other city in the Union, except New York. New Orleans sends yearly to Europe cotton valued at nearly $100,000,000. This city has also a very large trade in sugar, rice and corn.

New Orleans has had rapid growth in manufactures. Among the cities of our country, it takes high rank in the refining of sugar.

New Orleans is an important railroad center. The *Southern Pacific* system connects it with points westward to the Pacific coast. The *Illinois Central,* the *Queen and Crescent* and other routes lead northward to Chicago, Cincinnati and other cities.

Shreveport, on the Red river, is in a rich cotton district. This city is the second cotton market in the state, and has a large river traffic. Steamboat and railroad lines connect it with New Orleans. **Baton Rouge** is the capital.

TEXAS. Texas is the largest state in the Union. Its area is greater than that of all the New England and Middle states together. The state of Texas may be divided into three districts, each of which is as large as Great Britain.

Dallas and **Fort Worth** are in the northeastern part of the Texas prairies, — in a rich farming and grazing district. Both these cities handle great quantities of wheat and corn; and both have large flouring mills.

Dallas is a leading market for farming implements. Fort Worth has great stock yards. Many cattle are sent from this district to northern markets.

San Antonio is an important center on the Southern Pacific railroad, and on the main railroad line running

southward into Mexico. This city is the trade center of southwest Texas.

San Antonio is famous in the history of Texas. Not long after the United States purchased the vast territory of Louisiana west of the Mississippi river, thousands of Americans crossed the border and settled in Texas, which was then a part of Mexico. When the Mexicans tried to oppress the Americans, the latter rose in arms and won the freedom of their state.

One of the fiercest struggles in this war took place in a building known as the *Alamo*, in San Antonio. Here a small band of Americans was attacked by a large force of Mexicans. The Americans fell fighting to the last, rather than surrender. Texas was soon afterwards admitted into the Union.

Galveston ranks high among the cotton ports of our country. Among its other exports are hides and wool.

Houston is an important railroad center, and is situated on the navigable *Buffalo Bayou*. **Austin** is the capital.

ARKANSAS. **Little Rock** is the capital and largest city in Arkansas. Large quantities of cotton-seed oil and oil-cake are made in this city.

Fort Smith is a trade center in the western part of the state. **Hot Springs** is a well-known resort for invalids.

OKLAHOMA. In recent years Oklahoma has grown more rapidly than any other state. Its fertile soil produces cotton, corn and wheat. Many cattle and sheep graze in the state. There are also rich coal lands.

Oklahoma and **Guthrie** are the principal cities near the center of the new state. **South McAlester** and **Muscogee** are leading cities farther east.

154. Review and Map Studies.

Which is farthest north, — Chicago, Boston or Rome (Italy)?

Which of the states in this section border on lake Michigan? Which state has the longest lake coast?

Study the maps on pages 21, 24, 128 and 129, and then tell what you can about the climate of this group of states.

Which part of this section is mountainous? Which of the states in this group are partly within the Allegheny plateau region? Describe this part of the plateau. Name some of its products. *See lessons 47, 136, 137, 140 and 142.*

Which of the states of this group lie partly within the St. Lawrence basin? Name some of the products of the old worn-down highland near lake Superior. *See lesson 49.* Which part of this group of states is in the great soft-wood forest belt? *See lesson 134.* Which parts have valuable hard-wood forests?

What do you know about the soil of the prairies? *See lesson 51.* What are the principal products of the prairies?

On what bodies of water does a vessel sail in going from Chicago to Cleveland? — From Duluth to Buffalo?

Locate the capitals of the states in this section.

155. Central States, — Eastern Section.

Though the Central states have no seacoast, and therefore little foreign commerce, yet they have fine water ways for inland commerce on the Great Lakes and the Mississippi system. Moreover, most of the section is so level or so gently rolling that railroads are built at small expense, and freight rates by rail are therefore low.

These states form the best farming and grazing district in our country, so that meat-packing and flour-milling are very important industries. The iron mines in the lake Superior region are without a rival. The copper mines in the same district are only slightly surpassed by those of Montana.

The pine forests around the upper lakes, and the hard-wood forests a little farther south, give this section first rank in lumber, as well as in the manufacture of farming machines, furniture and carriages. Beds of soft coal, and wells of natural gas, supply fuel for the extensive manufactures. The eastern and southern portions of this section hold first place in the production of wool, tobacco and hemp.

Such are the natural advantages and fruitful industries of the Central states to-day, although many people are still living who can recall the time when most of the region was a wilderness, and when even Chicago was only a frontier trading town on the small river which now flows through the second largest city in all America.

Ohio. **Cincinnati** has about ten miles of water front on the Ohio river, and fully a score of railroad lines enter this city. It has therefore grown to be a center of trade for a great area of farming and grazing country. The chief manufactures of Cincinnati are clothing and liquors. Large numbers of cattle and hogs are raised in the Ohio valley, and many of these are sold in Cincinnati. Meat-packing is therefore an important industry. Many kinds of iron goods also are made here.

Cleveland is within easy reach of the coal fields of Ohio and Pennsylvania; of the oil districts in the same states; of the iron mines of the lake Superior region; of the soft-wood forests of Michigan, and the hard-wood forests of Ohio.

With these advantages, Cleveland has become a leading city in iron and steel manufactures, in oil refining, in ship-building, and in other great industries. Many steamers for the lake traffic are built in this city.

Columbus, the capital, is a trade center for middle Ohio. This city is noted for the manufacture of fine carriages.

Toledo has docks several miles in length, and is a shipping point for grain, flour, iron ore, lumber and coal.

Dayton is the center of a fine farming region and is also a great manufacturing city.

Youngstown is an important center of iron manufactures.

Farming tools are made in several of the large cities of this section. Among these are *Springfield, Akron* and *Canton.*

INDIANA. **Indianapolis** is the center of trade of the rich farming and grazing district of middle Indiana. Several lines of railroad meet in this city. They bring in grain and cattle, and carry back the various kinds of goods which are needed on the great farms.

Meat-packing and flour-milling are leading industries in the state capital.

Evansville is the principal shipping point for the grain, flour and meat products of southwest Indiana.

Fort Wayne is an important trade center in the northeast part of the state. Many railroad cars are made in this city.

South Bend is famous for its wagons and plows.

New Albany is an important port on the Ohio river.

Longitude West from Greenwich
93
91
89
87
85
83
81
ONTARIO
ISLE ROYAL
MICHIPICOTEN I.
LAKE SUPERIOR
APOSTLES Is.
Duluth
Washburn
Superior
Ashland
Ontonagon
Calumet
Hancock
Houghton
Keweenaw Pt.
Keweenaw Bay
Marquette
Pictured Rocks
Sault Ste. Marie
St. Ignace
Mackinac
Cheboygan
Petoskey
Alpena
Rice Lake
Rhinelander
Iron Mountain
Crystal Falls
Escanaba
Norway
Manistique
Merrill
Antigo
Manominee
Marinette
Oconto
Wausau
Chippewa Falls
Eau Claire
Hudson
Menominee
Marshfield
Stevens Point
Black River Falls
Grand Rapids
Appleton
Fond du Lac
Green Bay
Sturgeon Bay
Traverse City
Kalkaska
Au Sable
Manistee
Cadillac
Necedah
Tomah
Sparta
La Crosse
Berlin
Oshkosh
Manitowoc
Ripon
Winnebago L.
Ludington
Big Rapids
W. Bay City
Bay City
Saginaw
Mt. Pleasant
Muskegon
Grand R.
Wisconsin R.
Portage
Baraboo
Wanpun
Beaverdam
Sheboygan
Port Washington
Watertown
Prairie du Chien
MADISON
MILWAUKEE
Greenville
St. Johns
Mineral Point
Platteville
Stoughton
Fort Atkinson
Monroe
Janesville
Beloit
Whitewater
Waukesha
Racine
Kenosha
Grand Haven
Holland
Grand Rapids
Allegan
Hastings
Charlotte
LANSING
Mt. Clemens
Port Huron
Marine
Pontiac
Flint
Dubuque
Galena
Elizabeth
Belvidere
Rockford
Waukegan
South Haven
Battle Creek
Kalamazoo
Jackson
Ann Arbor
DETROIT
Wyandotte
St. Clair
Benton Harbor
Marshall
Albion
Ypsilanti
Dowagiac
Three Rivers
Adrian
Conneaut
Ashtabula
Sterling
Dekalb
Dixon
Aurora
Elgin
Evanston
CHICAGO
St. Joseph
Niles
Coldwater
Hillsdale
Monroe
Michigan City
Laporte
South Bend
Elkhart
Goshen
Toledo
Fremont
Sandusky
Oberlin
Elyria
CLEVELAND
Painesville
Warren
Youngstown
Moline
Rock Island
Kewanee
Spring Valley
Peru
Ottawa
Joliet
Lasalle
Streator
Braidwood
Kankakee
Valparaiso
Defiance
Fostoria
Norwalk
Akron
Findlay
Tiffin
Galesburg
Monmouth
Pontiac
Peoria
Normal
Canton
Pekin
Bloomington
Macomb
Logansport
Wabash
Huntington
Van Wert
Lima
Bluffton
Marion
Kenton
Bucyrus
Mansfield
Galion
Massillon
Canton
Wooster
Alliance
Salem
Fort Wayne
Kokomo
Lafayette
Harford City
Elwood
Portland
Bellefontaine
Mt. Vernon
Sidney
Piqua
Troy
Urbana
Delaware
Newark
Cambridge
Zanesville
Beardstown
Quincy
Jacksonville
Springfield
Lincoln
Champaign
Urbana
Danville
Decatur
Paris
Charleston
Mattoon
Terre Haute
Frankfort
Lebanon
Crawfordsville
Anderson
Muncie
Greenville
Richmond
Dayton
Xenia
Springfield
COLUMBUS
Circleville
Lancaster
Nelsonville
Marietta
Belleaire
Litchfield
Pana
Effingham
Greencastle
Brazil
Shelbyville
Franklin
Greensburg
Middletown
Hamilton
Cincinnati
Chillicothe
Wellston
Jackson
Columbus
Lawrenceburg
Dayton
Alton
East St. Louis
Belleville
Centralia
Olney
Vincennes
Bedford
Washington
Seymour
Madison
Covington
Newport
Portsmouth
Gallipolis
Ironton
Mitchell
Carrollton
Ohio R.
Maysville
Ashland
Catlettsburg
Mt. Carmel
Huntingburg
Jeffersonville
Cynthiana
Duquoin
Mt. Vernon
Carmi
New Albany
Shelbyville
FRANKFORT
Paris
Mt. Sterling
Evansville
LOUISVILLE
Lexington
Winchester
Nicholasville
Harrodsburg
Cloverport
Murphysboro
Mt. Vernon
Henderson
Owensboro
Elizabethtown
Richmond
Danville
Lebanon
Morganfield
Madisonville
Earlington
Princeton
Mammoth Cave
Somerset
Barbourville
Pineville
Middlesboro
Williamsburg
Cairo
Paducah
Metropolis
Mayfield
Hickman
Fulton
Hopkinsville
Russellville
Bowling Green
Glasgow
Franklin
CENTRAL STATES
EASTERN SECTION
SCALE OF MILES
0 20 40 60 80 100 120
DOMINION OF CANADA
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
Rio Grande R.
Missouri R.
Mississippi R.
Ohio R.
Tennessee R.
Cumberland R.
Kentucky R.
Green R.
Wabash R.
White R.
Illinois R.
Kaskaskia R.
Big Sandy R.
Kanawha R.
Monongahela R.
Allegheny R.
Susquehanna R.
Potomac R.
Shenandoah R.
James R.
Roanoke R.
Chesapeake Bay
Delaware Bay
Delaware R.
Hudson R.
Lake Champlain
Lake Ontario
Lake Erie
Lake Michigan
Lake Huron
Lake St. Clair
Niagara R.
Niagara Falls
Georgian Bay
North Channel
Manitoulin I.
Saginaw Bay
Au Sable R.
Muskegon R.
Grand R.
Kalamazoo R.
St. Joseph R.
Maumee R.
Sandusky R.
Scioto R.
Miami R.
Big Sandy R.
Kanawha R.
New R.
Kentucky R.
Licking R.
Muskingum R.
Hocking R.
Scioto R.
Ohio R.
Wheeling
Parkersburg
Charleston
Ashland
Catlettsburg
Maysville
Ironton
Portsmouth
Gallipolis
Pomeroy
Marietta
Wellston
Jackson
Chillicothe
Circleville
Lancaster
Zanesville
Cambridge
Bellaire
Steubenville
Wheeling
Wellsville
Canal Dover
New Philadelphia
Coshocton
Martins Ferry
Youngstown
Niles
Warren
Conneaut
Ashtabula
Painesville
Alliance
Massillon
Wooster
Salem
Canton
East Liverpool
Sandusky
Oberlin
Elyria
Norwalk
Akron
Findlay
Tiffin
Fostoria
Fremont
Defiance
Maumee
Toledo
Monroe
Hillsdale
Coldwater
Three Rivers
Adrian
Ypsilanti
Dowagiac
Benton Harbor
Marshall
Albion
Kalamazoo
Battle Creek
Jackson
Ann Arbor
Wyandotte
DETROIT
St. Clair
Grand Haven
Holland
Grand Rapids
Allegan
Hastings
Charlotte
LANSING
Mt. Clemens
Port Huron
Marine
Pontiac
Flint
Owosso
Tonia
Muskegon
Greenville
St. Johns
Big Rapids
W. Bay City
Bay City
Saginaw
Mt. Pleasant
Au Sable
Manistee
Cadillac
Ludington
Traverse City
Kalkaska
Au Sable R.
Manistee R.
Sturgeon Bay
Green Bay
Manitowoc
Sheboygan
Port Washington
Watertown
Prairie du Chien
MADISON
MILWAUKEE
Waukesha
Racine
Kenosha
Waukegan
Whitewater
Janesville
Beloit
Mineral Point
Platteville
Stoughton
Fort Atkinson
Monroe
Dubuque
Galena
Elizabeth
Belvidere
Rockford
Evanston
Elgin
Dekalb
Dixon
Aurora
Sterling
CHICAGO
Michigan City
Laporte
South Bend
Elkhart
Goshen
Niles
St. Joseph
Valparaiso
Hammond
Joliet
Lasalle
Ottawa
Peru
Rock Island
Moline
Kewanee
Spring Valley
Streator
Braidwood
Kankakee
Galesburg
Monmouth
Pontiac
Peoria
Normal
Canton
Pekin
Bloomington
Macomb
Beardstown
Quincy
Jacksonville
Springfield
Lincoln
Champaign
Urbana
Danville
Decatur
Paris
Charleston
Mattoon
Terre Haute
Fort Wayne
Logansport
Huntington
Wabash
Van Wert
Lima
Bluffton
Marion
Kenton
Bucyrus
Mansfield
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Massillon
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Wooster
Alliance
Salem
St. Marys
Kokomo
Lafayette
Harford City
Elwood
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Bellefontaine
Mt. Vernon
Sidney
Piqua
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Carrollton
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Cynthiana
Shelbyville
FRANKFORT
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Mt. Sterling
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Richmond
Danville
Lebanon
Somerset
Barbourville
Pineville
Middlesboro
Williamsburg
Mammoth Cave
Glasgow
Bowling Green
Russellville
Hopkinsville
Franklin
Mayfield
Hickman
Fulton
Paducah
Cairo
Metropolis
Madisonville
Earlington
Princeton
Morganfield
Henderson
Murphysboro
Mt. Vernon
Carmi
Duquoin
Mt. Carmel
Olney
Vincennes
Centralia
Belleville
East St. Louis
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Litchfield
Pana
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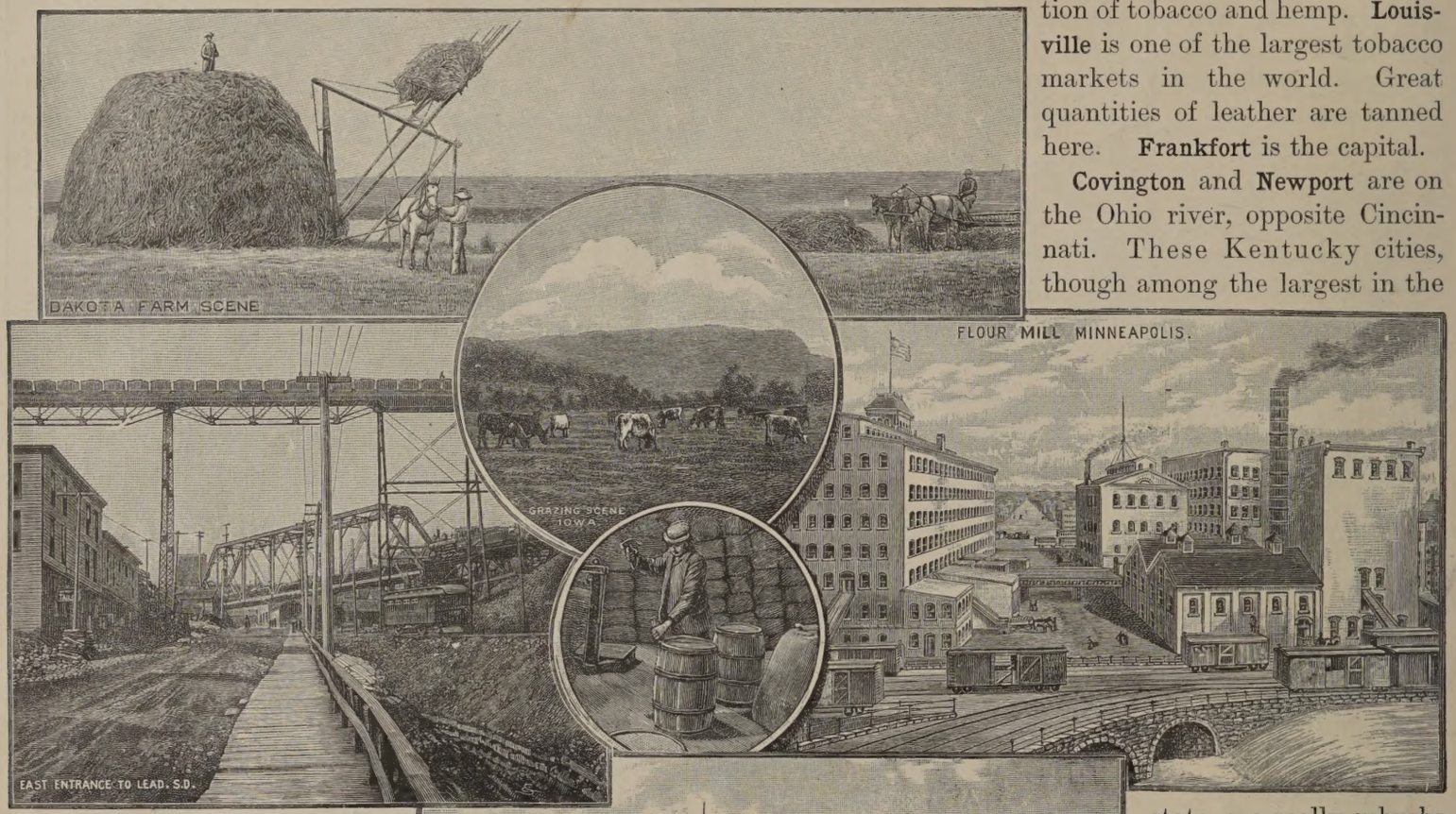
Wheeling
Parkersburg
Charleston
Ashland
Catlettsburg
Maysville
Ironton
Portsmouth
Gallipolis
Pomeroy
Marietta
Wellston
Jackson
Chillicothe
Circleville
Lancaster
Nelsonville

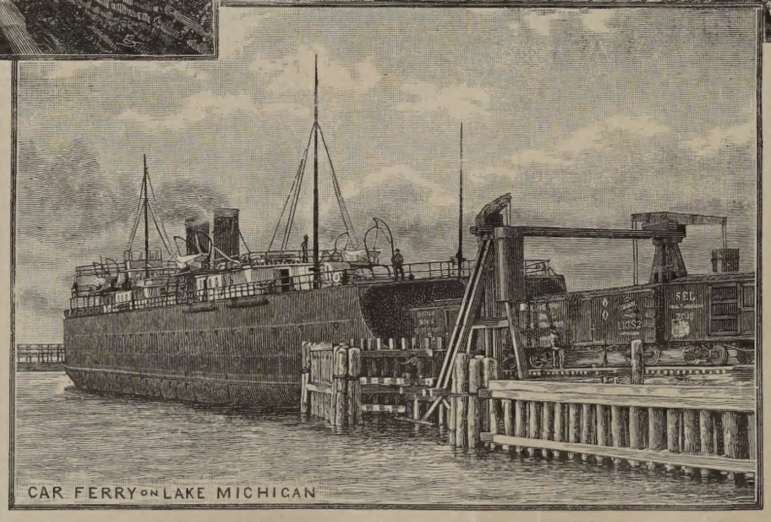
What have you learned about the Great Lakes as a water way? *See lessons 49 and 120.*

Among the railroad lines which center in Chicago are the following: the *Lake Shore and Michigan Southern* from Buffalo; the *Pittsburg and Fort Wayne* from Pittsburg; the *Illinois Central* from New Orleans; the *Atchison, Topeka and Santa Fe* from southern California; the *Wabash* from Kansas City and St. Louis; the *Chicago, Milwaukee and St. Paul* from Minneapolis and St. Paul.



The leading industry in **Peoria** is the manufacture of liquors. **Springfield,** the state capital, is a trade center for middle Illinois; and **Quincy,** for the western part of the state.

MICHIGAN. **Detroit** has a fine harbor on the Detroit river. This city, like Chicago and Cleveland, is within easy reach of the lumber and iron regions. Detroit is noted for the manufacture of cars and iron goods.



Grand Rapids has excellent water power in falls of the Grand river, and is also near the lumber districts. No other city in the lake region, except Chicago, manufactures as much furniture. **Lansing** is the state capital.

Saginaw, Bay City and **Muskegon** have an immense trade in lumber. The most productive salt-works in our country are in the district near the head of Saginaw bay.

WISCONSIN. **Milwaukee** is the second city in size on lake Michigan. This port has an excellent harbor, and carries on an extensive lake commerce similar to that of Chicago, though much less in value. The chief manufactures of Milwaukee are liquors and flour. Large quantities of meat are packed here.

La Crosse, Oshkosh and **Eau Claire** are lumber markets.

Racine is one of the cities which manufacture wagons and farming implements. **Madison** is the capital.

KENTUCKY. This state takes the lead in the cultivation of tobacco and hemp. **Louisville** is one of the largest tobacco markets in the world. Great quantities of leather are tanned here. **Frankfort** is the capital.

Covington and **Newport** are on the Ohio river, opposite Cincinnati. These Kentucky cities, though among the largest in the state, are really suburbs of Cincinnati. They contain many fine residences.

Lexington is in the *Blue Grass region,* — a district famous for fine horses.

156. Review and Map Studies.

Locate this group of states. What two large cities in this section are about halfway between the equator and the north pole? Which extends farther north, — Maine or Minnesota? Which states in this group are west of Illinois?

What do the maps on pages 21, 24, 128 and 129 show about the climate of this group of Central states?

Where does the Mississippi river rise? What river of the Nelson system rises near by? How do you account for the richness of the soil in the Red river prairies? *See lesson 51.*

In which states do the prairies merge into the Western plains?

Describe the general course of the Missouri river across this group of states. Across which state does the Platte river flow? Where are the Black hills? What do they yield? *See lesson 50.*

Describe the highland in southern Missouri. *See lesson 47.*

Name the capitals of the states in this group. Which of the capitals are on the Missouri river? Which is on the Mississippi?

157. Central States, Western Section.

The prairie portion of the states in this Western section is in the wheat and corn area. Almost the entire section is suited to grazing. In the northeast are portions of the lumber and the iron districts.

The principal industries of these states are farming, grazing, lumbering, flour-milling and mining.

Missouri. **St. Louis** has a population about equal to that of Boston. The former city is the principal trade center of the middle Mississippi valley, and is reached by railroads and rivers from nearly all parts. Many of the products of this fertile valley find a market in St. Louis; and this city sends out groceries, clothing and agricultural implements.

No American city, except Minneapolis, surpasses St. Louis in the production of flour. This great river port is near the Kentucky tobacco district and ranks next to New York in the manufacture of tobacco goods. Meat-packing is an important industry in St. Louis.

Kansas City is one of the leading railroad centers in the Mississippi basin. This city therefore has an extensive trade with the surrounding agricultural districts. It is one of the greatest markets for farming implements in the country. **Jefferson City** is the state capital.

St. Joseph and **Springfield** are important trade centers.

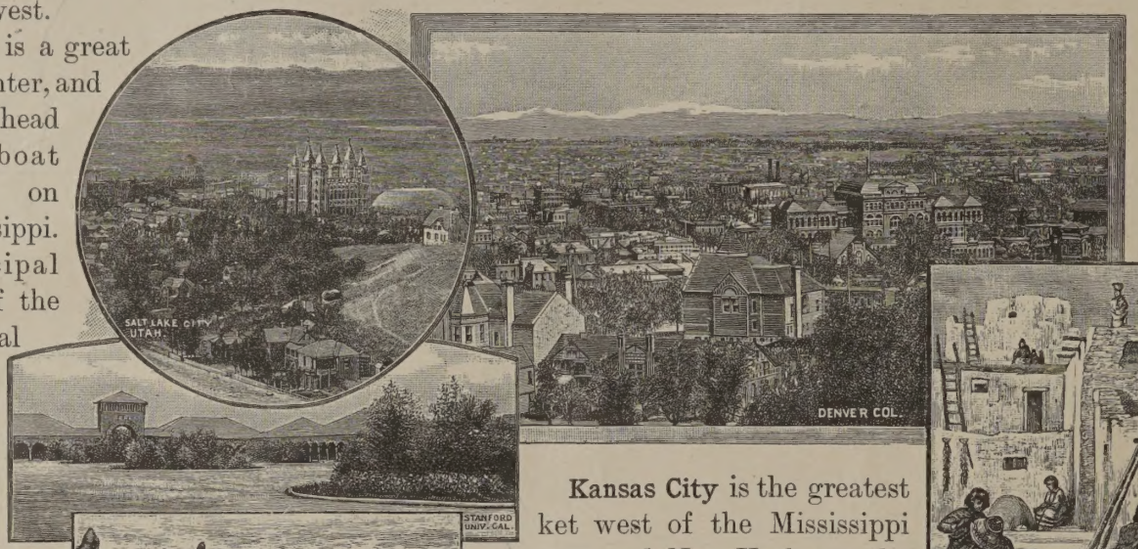
Iowa. **Des Moines,** the capital, is in the heart of the rich Iowa prairie region. This city is a market for grain, cattle and dairy products, for which the state is famous.

Sioux City is a large grain and meat market.

Dubuque, Davenport and **Burlington** are important river ports and lumber markets. These cities have a large trade in the agricultural products of the state.

Minnesota. The flour made yearly in **Minneapolis** could not be purchased by all the gold mined in our country during the same length of time. No other city

in the Union produces one half as much flour. More than one fourth of Minnesota is covered with forests of white pine. The Mississippi river above Minneapolis is fed by many streams from the forest area, and this city has therefore become the leading lumber market in the Northwest.



St. Paul is a great railroad center, and is at the head of steamboat navigation on the Mississippi. The principal industry of the state capital consists in gathering the products of the surrounding region, and in shipping supplies to the farming and the lumbering districts.

Duluth is the eastern terminus of the Northern Pacific railroad, and is at the southwestern end of lake Superior. This city is the outlet of the wheat district in the Red river prairies.

Winona is a lumber market on the Mississippi river.

North Dakota. This state lies north of the corn belt, but its wheat district in the Red river valley has no superior. A large part of this state affords excellent grazing land for cattle and sheep. **Fargo** and **Bismarck,** the capital, are the most important trade centers.

South Dakota. The prairies in the northeast part of this state form a portion of the famous wheat region which extends also into North Dakota. The southeast part of South Dakota is in the corn belt.

Sioux Falls and **Pierre** are points of supply. Pierre is the state capital.

The Black hills, with their valuable gold mines, lie mostly within the western part of South Dakota.

Nebraska. The best farming land of Nebraska, as of the two Dakotas, is in the eastern half of the state. Corn is the most valuable product. The other half of the state forms part of the Western plains where cattle-raising is the chief occupation.

Omaha is a large railroad center and a shipping point for cattle and grain.

Lincoln, the capital, is reached by several railroads and has grown to be the most important trade center in the corn and wheat region of southeastern Nebraska.

Kansas. This state, like the states named above, is about half prairie and half plains. The chief products are corn, wheat and cattle. The grains grow best in eastern Kansas.

Kansas City is the greatest meat market west of the Mississippi river. Chicago and New York are the only American cities which surpass Kansas City in the value of their meat-packing industries. Each year thousands of cattle from the Texas prairies are sent north to be fattened in the corn area of Kansas and the neighboring states.

Topeka, Wichita and **Leavenworth** are important market centers in the grain and cattle districts. Topeka is the capital.

158. Review and Map Studies.

Locate this group of states and territories? Which are territories? *See lesson 125.*

What portion of the Atlantic coast of our country is due east of California? Which is farther north, — San Francisco or St. Louis?

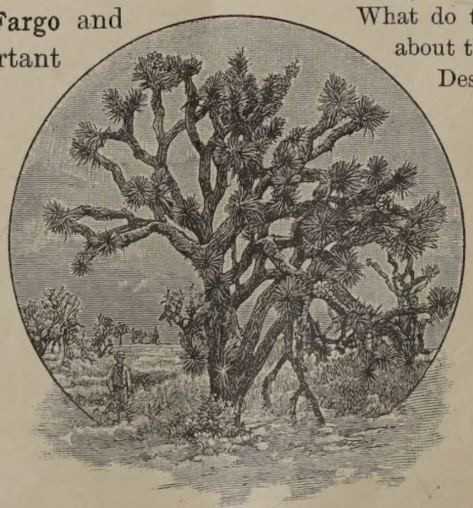
If a ship were to sail due west from San Francisco, what large Asiatic island would it reach?

What do the maps on pages 21, 24, 128 and 129 show about the climate of this group of states?

Describe the park region of Colorado. *See lesson 34.* Describe the Colorado plateaus. *See lesson 38.* How does the Basin region differ from the Colorado plateau region?

In what respects does the valley of California resemble the plain of Chile? *See lessons 40 and 57.* What are the principal products of the Southwestern states? *See lessons 130, 134, 136 and 143.*

Locate the capitals of the states and territories in this group.



Yucca Trees, Mohave Desert.

159. Southwestern Group.

This group of states and territories includes several regions whose industries differ widely from one another. On the east are the grazing lands of the Western plain. Next on the west is the rich mining district of the Rocky mountains. Still farther west and southwest are the thinly settled Basin

region and the Colorado plateaus. In the Sierra Nevada is another mining belt and a lumber district. The valley of California is one of the finest wheat and grape regions in the world. The southern portion of this state excels in high grades of oranges. The Coast range yields excellent lumber.

California contains more than half the people in this group of states and territories, yet even this great state has a population smaller than that of New York city.

The raising of cattle and sheep is the principal industry. Silver ore is mined in this territory.

Santa Fe and **Albuquerque** are the chief trade centers. The former is the second oldest town in our country.

Utah. Utah now ranks third in the production of silver, — Colorado being first, and Montana second. Some portions of Utah, especially along the small river valleys, are irrigated. They yield grain and vegetables.

Colorado. **Denver** is a supply city for mining districts in the Rocky mountains, and for cattle ranches on the Western plains. Few cities in our country have had a more rapid growth than this state capital.

Pueblo and **Leadville** have large smelting works. The latter city is in the heart of the Rocky mountains, nearly two miles above sea level. It is one of the greatest silver-mining cities in the world.

Colorado Springs is a well-known resort for invalids.

New Mexico. This territory is mostly in the basin of the Rio Grande. Santa Fé is the capital.

Salt Lake City and **Ogden** are important railroad centers and points of supply. The former is the capital.

Arizona. Silver and copper are the principal products of the mines in this territory. Arizona ranks high in the output of copper. There are good irrigated farms in the basin of the Gila river, west of the Colorado plateau region. **Phœnix** is the capital.

Tucson and **Phœnix** have a large trade in outfits for miners.

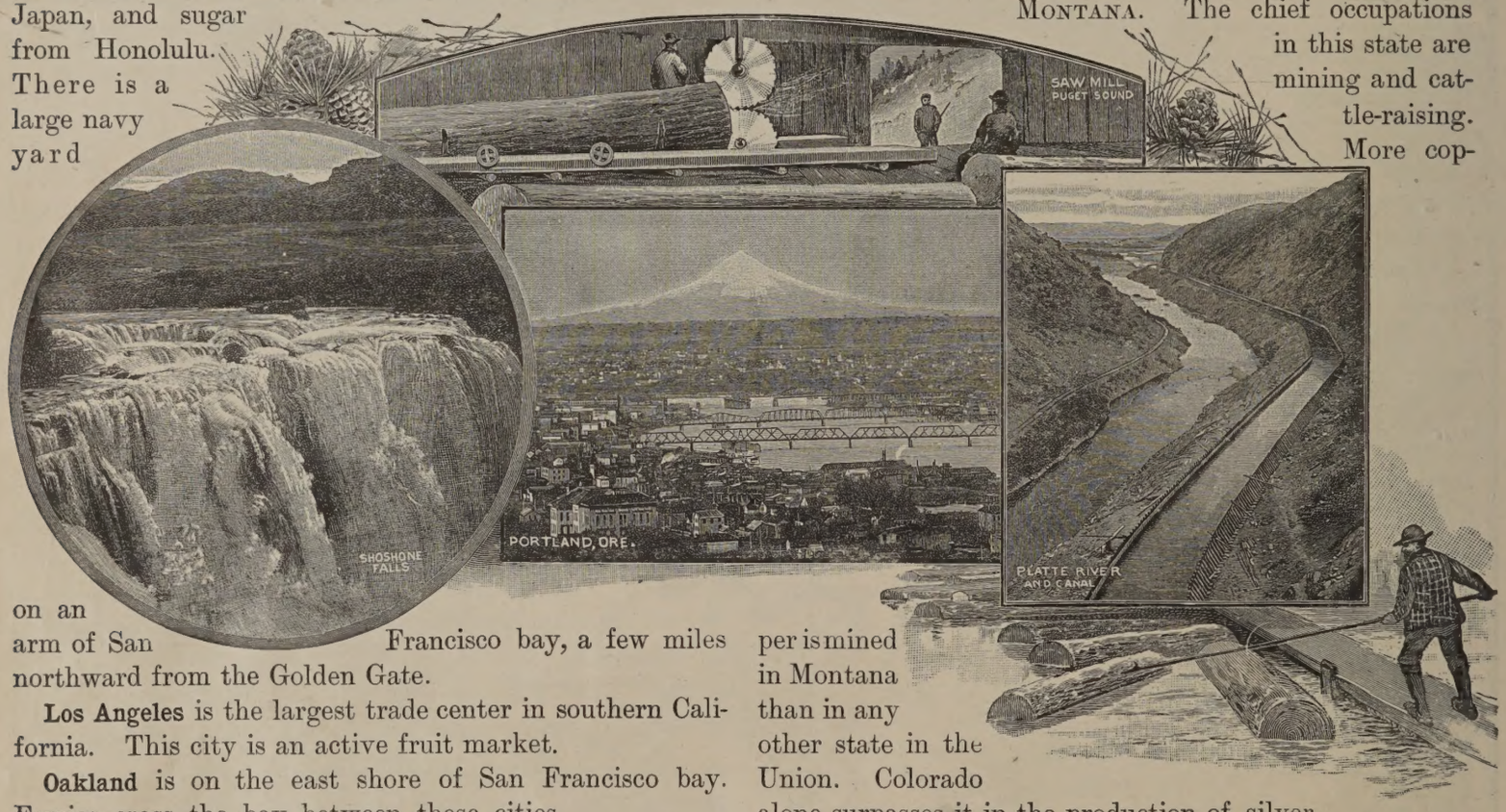
Nevada. Silver and gold mining rank first among this state's industries. The river valleys are suited to farming and grazing. **Carson City** is the capital.

Virginia and **Carson City** are well-known mining centers.

CALIFORNIA. **San Francisco** is the natural outlet for the products of the valley of California. More wheat is exported from this seaport than from any other American city. It leads also in the refining of sugar.

San Francisco has a large inland trade in wheat, flour and fruits. The principal manufactures of the city are clothing, boots and shoes.

Among the imports are silk and tea from China and Japan, and sugar from Honolulu. There is a large navy yard on an arm of San Francisco bay, a few miles northward from the Golden Gate.



Los Angeles is the largest trade center in southern California. This city is an active fruit market.

Oakland is on the east shore of San Francisco bay. Ferries cross the bay between these cities.

Oakland is largely a city of residences. It is the home of many persons whose business is in San Francisco.

Sacramento, the capital, has a large trade in wheat.

160. Review and Map Studies.

Which is farther north, — Portland (Oregon) or Montreal?

Refer to the maps on pages 21, 24, 128 and 129, and describe the climate of the Pacific coast of this group. In what respect does the climate of eastern Montana differ from that of western Washington? How do you account for the difference in climate between Oregon and New England?

In what direction do the Rocky mountains extend across this group of states? Which of the states are partly in the Western plains? What valuable minerals are found in Montana? *See lessons 143 and 144.*

What part of this section is buried in ancient lava-flows? *See lesson 39.* Describe the Cascade range; the Coast range. *See lessons 36 and 40.* Why is the seacoast northward from Puget sound so irregular? *See lesson 40.* Name the state capitals in this group.

ALASKA. — Locate Sitka. *See map on page 126.* Which is farther north, — Sitka or St. Petersburg?

Why is the climate of southwestern Alaska so mild? What are the principal products of Alaska? *See lesson 41.*

161. Northwestern Group.

The industries in this group of states are similar to those in the group on the south. There are the grazing districts of the Western plains, the mining regions of the Rocky mountains, the barren lava plains, the wheat lands in the Willamette valley, the forested slopes of the Cascade and Coast ranges.

These five states together have a population less than that of either New York or Chicago.

MONTANA. The chief occupations in this state are mining and cattle-raising. More copper is mined in Montana than in any other state in the Union. Colorado alone surpasses it in the production of silver. The gold mines of Montana are very productive.

Both **Helena** and **Butte** have a large trade in mining outfits. There are also extensive smelting works in these cities. Helena is the state capital.

WYOMING. This state has few mines, but it has immense cattle ranches. **Cheyenne** and **Laramie** are the principal trade centers. The former city is the capital and one of the largest cattle markets in America, because it is the only shipping point for a large grazing area.

The greater portion of Yellowstone park is in northwest Wyoming.

IDAHO. Mining is the chief industry of Idaho, — with silver, gold and lead as the products. The river valleys in the northern part of this state form a very productive wheat district.

Boise is the capital and the trade center of Idaho.

OREGON. The portion of this state east of the Cascade range has large cattle ranches. The Willamette valley is an excellent wheat district. Many sheep are also raised here. The Cascade and Coast ranges are heavily

forested, and they yield valuable lumber products. There are extensive salmon fisheries in the Columbia river.

Portland, on the Willamette branch of the Columbia river, is the commercial center of the state.

Salem, the capital, is in the wheat and the wool district of the Willamette valley.

WASHINGTON. The industries of this state resemble those of Oregon. Wheat is the leading product of middle and southeast Washington. The country around Puget sound is one of the best lumber districts in the world. Coal also abounds here. Washington shares with Oregon the salmon fisheries of the Columbia river.

Seattle and **Tacoma** are important cities on Puget sound. They have excellent harbors and are the trade centers of the state. Both are large lumber markets.

Spokane, the center of trade in eastern Washington, has fine water power. **Olympia** is the capital.

ALASKA. Two thirds of the people in this territory are Indians. The others are white settlers and Eskimos.

The shore waters and the rivers of Alaska abound in salmon. Fur seals in large numbers are taken on the Pribilof islands.

Juneau is the capital of the territory. **Sitka** is on one of the southeast islands. *See Plate B, Supplement.* Gold is found in the Yukon valley and near the south coast. The Klondike gold region is in Canada.

The first white settlers in Alaska were Russian fur traders. In 1867 Russia sold Alaska to the United States for $7,200,000. This is a small sum compared with the value of the furs, the fish, the gold and the lumber which this northern region yields.

Alaska is about one sixth as large as the rest of our country, but only a small portion of this territory is suitable for the homes of white people.

The best part of Alaska is the southwest coastal region.

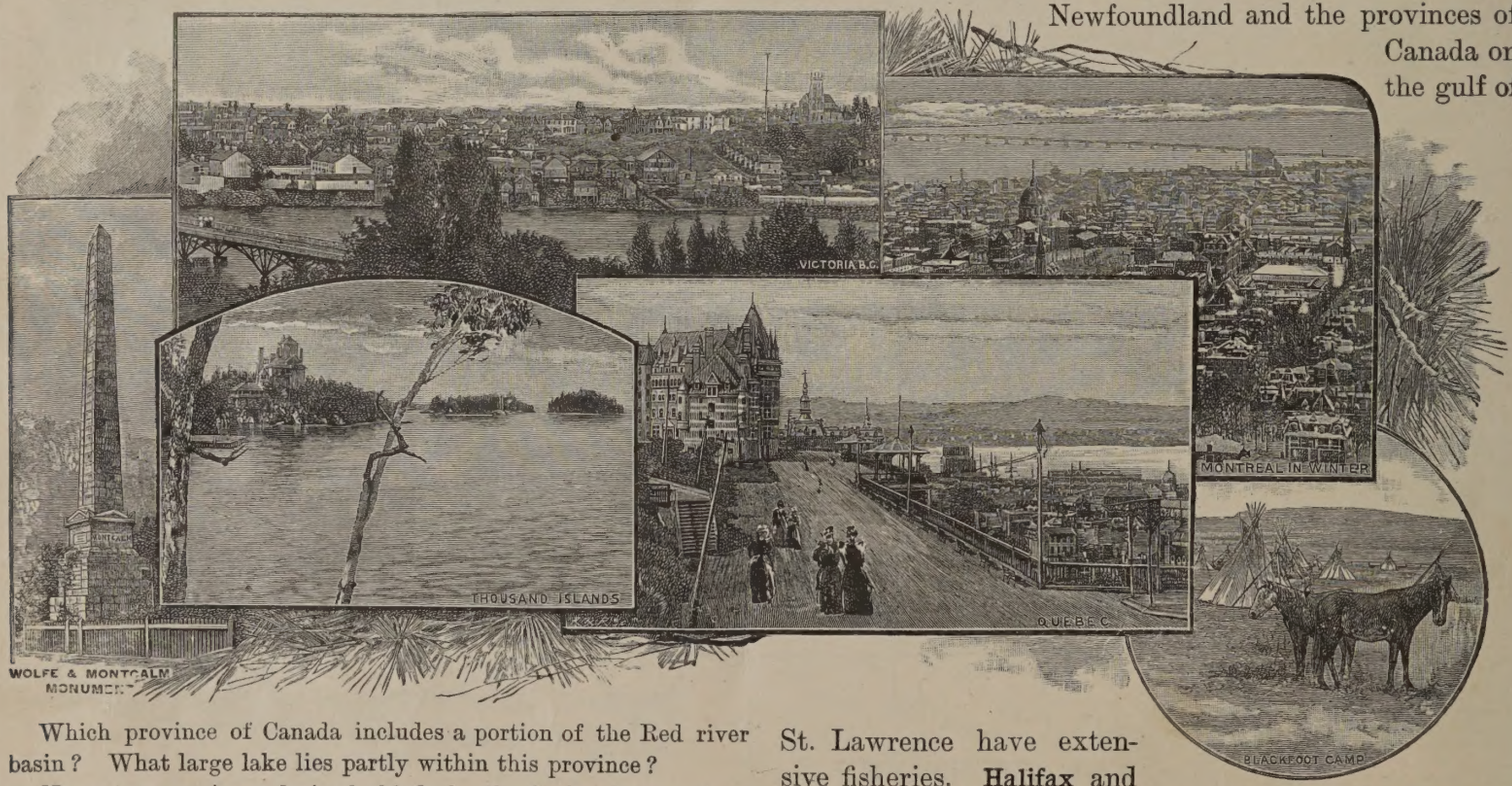
Rainfall is plentiful in this northern land, but the warm season is too short to ripen grain.

162. Review and Map Studies.

NOTE: The *Dominion of Canada* consists of various *provinces* and *districts*. Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia are provinces; the other divisions, formed of parts of the thinly settled regions, are called districts. The province of Newfoundland, including the northern district of Labrador, is not a part of Canada; but both Newfoundland and Canada belong to the British Empire.

What large bodies of water partly surround the province of Ontario? What river separates Ontario from New York? Through what province does the St. Lawrence river flow?

Locate Nova Scotia; — New Brunswick; — Prince Edward island. What large island forms the northern part of the province of Nova Scotia? Between what provinces is the bay of Fundy?



Which province of Canada includes a portion of the Red river basin? What large lake lies partly within this province?

Name two provinces drained chiefly by the Saskatchewan river. What two provinces meet in the Rocky mountains? Which province is almost wholly within the Rocky mountain highland? Name a large island belonging to this province.

Name three large lakes that form part of the Mackenzie system. What large lake lies partly within Manitoba? What do the maps on pages 21 and 24 show about the climate of Canada? *See also lessons 48, 52 and 127.*

163. Canada and Newfoundland.

Canada is about equal in area to the United States, but the population of the former is less than one twelfth that of the latter.[1] The provinces of Canada, — in their surface, their products and their climate, — resemble the portions of our country which they adjoin; but the winter climate of Canada, except in British Columbia and southeast Ontario, is more severe than that of the states along our northern border.

The best portion of Canada is the region lying among lakes Huron, Erie and Ontario, and thence extending along the St. Lawrence river to Quebec. This region includes parts of both Ontario and Quebec. Barley and wheat thrive here; soft-wood forests abound; and large numbers of sheep and cattle find excellent pasturage.

In this productive area are found most of the large cities of Canada. Among these are **Montreal, Toronto, Quebec, Hamilton** and **Ottawa.** These cities have a large trade in lumber, barley, sheep and wool, cattle and hides.

Newfoundland and the provinces of Canada on the gulf of St. Lawrence have extensive fisheries. **Halifax** and **St. Johns** send large quantities of codfish to our country. Most of these are caught on the banks of Newfoundland.

New Brunswick, like Maine, is in the forest belt. **St. John** exports lumber, largely to the United States.

The province of Manitoba includes parts of the Red river prairie region. **Winnipeg** therefore exports wheat. British Columbia, like the state of Washington, has valuable coal mines, forests and fisheries. This province and the Klondike region farther north (*see Plate B, supplement*) yield large amounts of gold. The chief city of the province is **Victoria,** on Vancouver Island.

[1] A large part of Canada once belonged to France, and many people of French descent live in this portion of North America. They are now greatly outnumbered by the English-speaking population.

164. Review and Map Studies.

MEXICO. What bodies of water partly surround Mexico? Describe the highland of Mexico. *See lesson 42.* What have you learned about the coastal region of this country? Where is the isthmus of Tehuantepec?

Refer to the maps on pages 21 and 24, and tell what you can about the climate of Mexico. *See also lesson 42.* Tell what you know about the people of Mexico, and their form of government. *See lessons 98 and 103.*

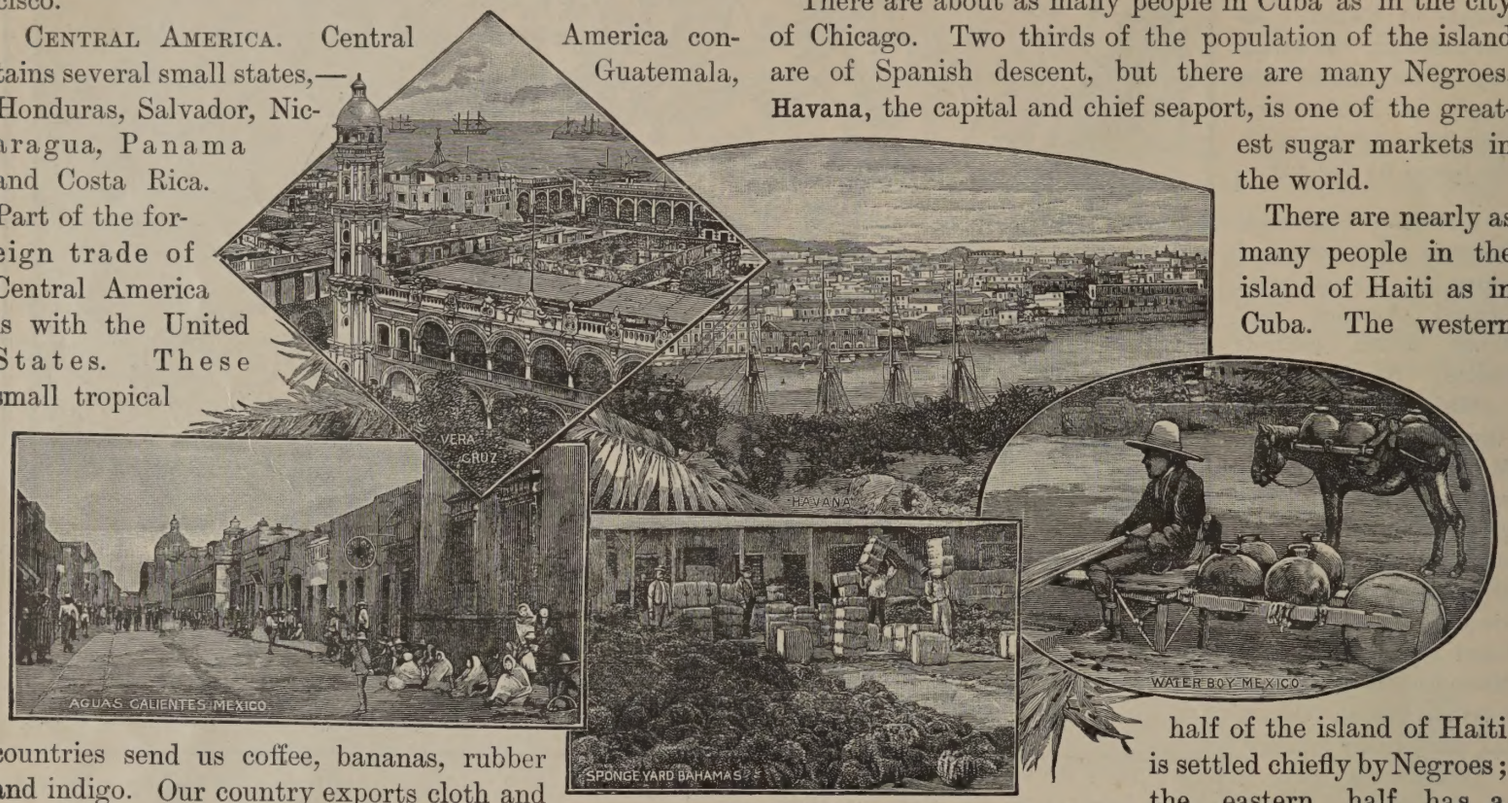
CENTRAL AMERICA. Between what bodies of water do the states of Central America lie? What nation controls Belize? *See lesson 103.*

Which of the Central American states adjoin Mexico? Which is the smallest state in this group? Between which states is lake Nicaragua? What have you learned about this lake? *See lesson 43.* Where is the Mosquito coast? Panama was once a part of Colombia, but is now a republic.

DOMINION OF CANADA
SCALE OF MILES
0 100 200 300 400 500 600
Comparative Area
400 MILES
PENNSYLVANIA
45,000 SQ MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ MILES
Longitude West from Greenwich
Arctic Ocean
Pacific Ocean
Atlantic Ocean
BAFFIN BAY
GREENLAND
Davis Strait
Hudson Strait
Hudson Bay
UNITED STATES
YUKON
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
LABRADOR
NEWFOUNDLAND
Mackenzie R.
Great Slave L.
Great Bear L.
Athabasca L.
Lake Winnipeg
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Hudson Bay Territory
Jamestown
Port Arthur
Winnipeg
Regina
Edmonton
Battleford
Vancouver I.
Victoria
Juneau
Sitka
Dawson
Ottawa
Montreal
Toronto
Hamilton
London
Quebec
Halifax
St. John's
Boston
New York
Chicago
Cape Breton
Anticosti
Grand Bank
Gulf of St. Lawrence
Bay of Fundy
Nova Scotia
New Brunswick
Prince Edward I.
Prince of Wales I.
Banks I.
Victoria I.
Baffin I.
Cockburn Land
Ellesmere I.
Melville Pen.
Cumberland Pen.
Boothia Pen.
Southampton I.
Melville Sd.
Lancaster Sd.
Barrow Str.
Magnetic Pole
Arctic Circle
C. Farewell
C. Chidley
C. Wolstenholme
C. Tatnam
C. Race
C. Sable
Fox Channel
Foxe Basin
Nelson R.
Great Whale R.
James Bay
Eastmain R.
Peace R.
Athabasca R.
Saskatchewan R.
Churchill R.
Red R.
Assiniboine R.
Winnipeg R.
Albany R.
Moose R.
Mississippi R.
Missouri R.
Ohio R.
St. Lawrence R.
Fraser R.
Yukon R.
Liard R.
Skeena R.
Queen Charlotte Is.
Vancouver I.
Lake of the Woods
Lake Nipigon
Lake Nipissing
Lake Timiskaming
Lake Temiscamingue
Lake Abitibi
Lake Mistassini
Lake Winnipegosis
Lake Manitoba
Lake Athabasca
Great Bear L.
Great Slave L.
Reindeer L.
Wollaston L.
Churchill
Peace R.
Battleford
Edmonton
Regina
Winnipeg
Port Arthur

Mexico, the capital and principal city of the republic, has a population somewhat larger than that of San Francisco.

CENTRAL AMERICA. Central America contains several small states,—Guatemala, Honduras, Salvador, Nicaragua, Panama and Costa Rica. Part of the foreign trade of Central America is with the United States. These small tropical countries send us coffee, bananas, rubber and indigo. Our country exports cloth and hardware to the Central American republics.



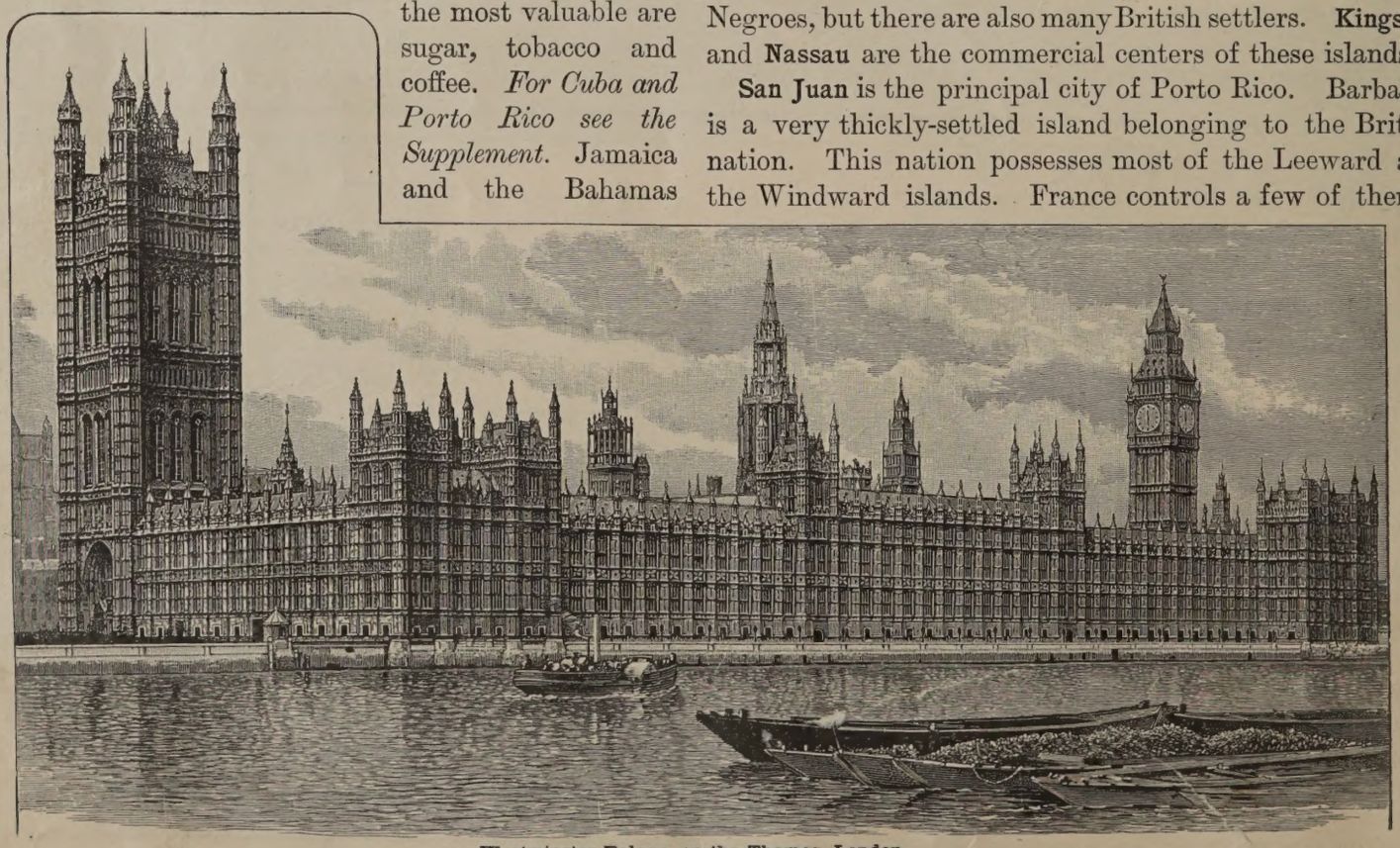
WEST INDIES. The name *West Indies* is given to the groups of islands which partly inclose the gulf of Mexico and the Caribbean sea. The products of these islands are similar to those of Mexico and Central America, but the most valuable are sugar, tobacco and coffee. *For Cuba and Porto Rico see the Supplement.* Jamaica and the Bahamas belong to Great Britain. The island of Haiti comprises the two small republics of Haiti and Santo Domingo.

There are about as many people in Cuba as in the city of Chicago. Two thirds of the population of the island are of Spanish descent, but there are many Negroes. **Havana**, the capital and chief seaport, is one of the greatest sugar markets in the world.

There are nearly as many people in the island of Haiti as in Cuba. The western half of the island of Haiti is settled chiefly by Negroes; the eastern half has a mixed population of Negroes and people of Spanish descent. The latter outnumber the former. **Port au Prince** and **Santo Domingo** are the principal cities of the island.

Jamaica and the Bahama islands are peopled largely by Negroes, but there are also many British settlers. **Kingston** and **Nassau** are the commercial centers of these islands.

San Juan is the principal city of Porto Rico. Barbados is a very thickly-settled island belonging to the British nation. This nation possesses most of the Leeward and the Windward islands. France controls a few of them.



Westminster Palace, on the Thames, London.

EUROPE.

166. Review and Map Studies.

Which parts of Europe are mountainous? Which are lowland? In what two regions do most of the large rivers of Europe rise?

What countries are grouped about the Swiss plateau? Which of these countries border on the Mediterranean sea or its branches?

What countries are wholly or partly included in Low Europe? Which of these countries border on the North sea? — On the Baltic sea? What countries lie along the west coast of the Black sea? What countries are crossed by the Arctic circle?

Where is the Ægean sea? — The Adriatic sea? — The bay of Biscay? — The gulf of Bothnia? — The sea of Azof?

Spain and Portugal. What part of the Atlantic coast of America is due west of Spain? In what direction are the British Isles from the Spanish peninsula? Locate Portugal.

Describe the surface of the Spanish peninsula. *See lesson 78.* What do you know about its climate? Name the principal products of Spain and Portugal.

What bodies of water partly surround the Spanish peninsula? What nation controls the rock of Gibraltar? Where are the Balearic islands?

Norway, Sweden and Denmark. What part of the coast of North America lies due west of Norway? How do you account for the mildness of the climate on the west coast of Norway? *See lesson 82.*

Describe the surface of Norway and Sweden. Into what sea and gulf do most of the rivers of Sweden flow? What are some of the products of the Scandinavian peninsula?

What kind of surface has Denmark? What country adjoins it on the south? What sea is on the west?

Russia. Describe the surface of Russia. *See lesson 85.* How were the many lakes and falls of Finland formed? *See page 86.*

Describe the climate of the great Russian plain. *See maps on pages 21 and 24; also lesson 85.* What are the leading products of Russia?

Describe the course of the Volga river; — of the Ural river. Where is the Dwina river? — The Dnieper river?

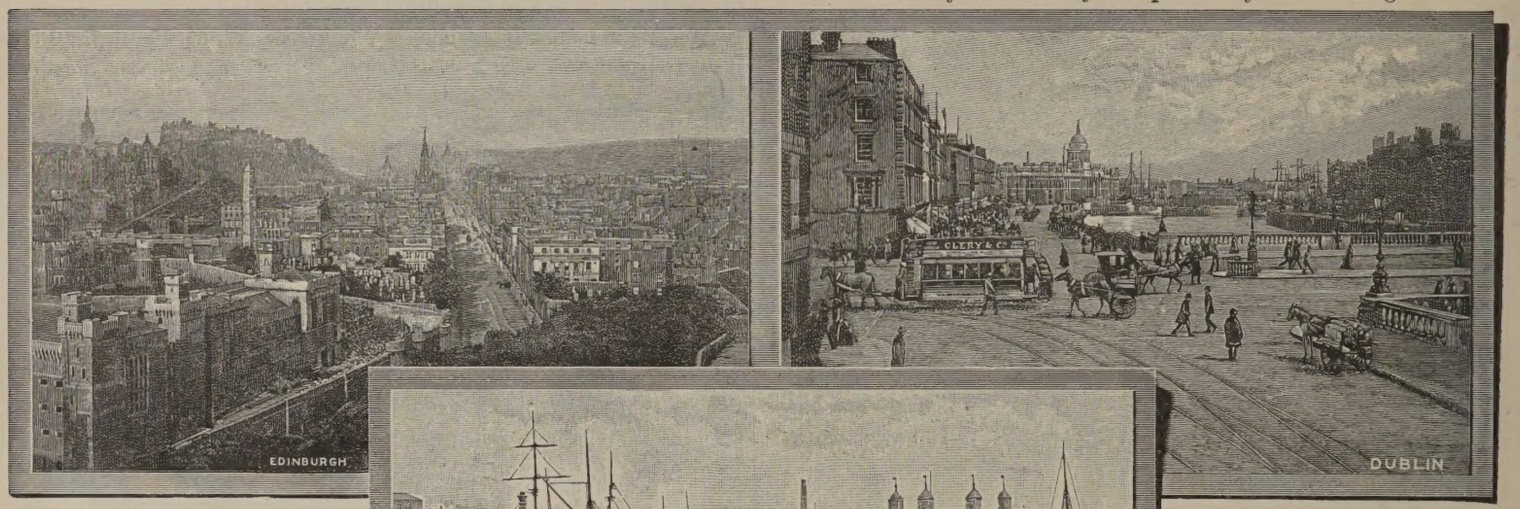
Locate lake Ladoga; — the gulf of Finland.

Name the seas which partly surround Russia. On what large bodies of water would a vessel sail in going from Odessa to St. Petersburg? What countries of Europe border on Russia?

167. Review and Map Studies.

Describe the surface of Scotland; — of England; — of Wales; — of Ireland. *See map on opposite page; also lesson 83.* Locate the Cheviot hills; — Grampian hills; — Ben-Nevis; — Snowdon.

What part of Ireland is drained by the Shannon river? Why are the Thames and the Mersey rivers so deep? *See lesson 83.* What have you learned about the basin of the Clyde river? Why is the northwest coast of the British Isles so irregular?



The fiords of Scotland are called *firths;* what firth partly separates England from Scotland? Where is the firth of Clyde? — The firth of Forth? Locate the Irish sea; — St. George's channel; — English channel; — strait of Dover; — Dublin bay. Where are the Orkney islands? — The Shetland islands? — The Hebrides?

On what bodies of water would a vessel sail in going from New York to Liverpool? — From New Orleans to London? Describe the steamer route from London to Bombay; — Liverpool to Hamburg.

What have you learned about the occupations of the people in the British Isles? *See lesson 83.*

168. The British Isles.

The government of the British Isles is a limited monarchy. The ruler holds office by claim of birth, but his authority is limited. The law-making power is given to Parliament.[1]

Parliament consists of two bodies, — the House of Commons and the House of Lords. The members of the former are elected by the people; the members of the latter are nobles and bishops.

The execution of the laws is in the hands of a Prime Minister who is assisted by a *Cabinet.* As in our government, the members of the Cabinet supervise the foreign affairs, the treasury, the army and other departments.

The British Isles constitute the *United Kingdom of Great Britain and Ireland.* The United Kingdom, with all British colonies and other possessions, forms the *British Empire.* The ruler of this empire appoints a *Governor* or a *Governor-General* for each colony. Some of the colonies take no part in governing themselves. Others elect their own officers, except Governors; but the British ruler retains authority to veto any bill passed by a colonial government.

The large British possessions, — such as the provinces of Canada, and the commonwealth of Australia, — have Parliaments of their own.

The foreign commerce of the British Isles is carried on mostly through the great ports of London, Liverpool and Glasgow.

London controls most of the British trade with India, Australia and the mainland of Europe; also a large part of the trade with tropical America.

From China and India, this great port receives tea, silk, sugar, coffee, spices, indigo and other products of southeast Asia. Greece sends currants; Italy and Spain send olive oil and wine.

From the Baltic ports, shiploads of lumber, wheat, cattle and wool reach London. Steamers from tropical America bring sugar, coffee, hides, rubber and cocoa. Australia ships chiefly wool and gold.

London, with its great trade, has grown to be the largest city and one of the chief seaports in the world.

Liverpool is the principal port for the manufacturing district of northwest England. This port receives the raw materials from abroad, and ships away the manufactured products.

[1] Parliament meets in Westminster palace, London. *See page 160.*

The United States sends more products to Liverpool than to any other port in the world. Most valuable among these are cotton, grain and meats. Large quantities of wool are sent from the Argentine Republic and from Australia to Liverpool.

The exports of Liverpool are mostly cotton, woolen and silk cloth; cutlery and other kinds of hardware; heavy iron goods, such as engines, rails and armor plates.

The rise and fall of the tide in the Mersey at Liverpool is so great that many steamers enter inclosed docks to load and unload. In these docks the water can always be kept at the same level. Other steamers use great landing stages that float, — rising and falling with the tide.

Glasgow leads all other cities in shipbuilding. The success of this city in making iron steamships is due chiefly to its excellent harbor, its nearness to mines of coal and iron ore, as well as to its skilled workmen. Glasgow carries on a large foreign trade for the manufacturing district of southern Scotland.

Manchester is one of the cities which owe their growth to the nearness of coal and iron. This city has the largest cotton mills in the world. Great quantities of woolen cloth also are made here.

A ship canal has lately been built from Manchester to the tidal portion of the Mersey river. Ocean steamers laden with cotton or wool can now reach this city, and thus save the cost of transfer by railroad from Liverpool.

Birmingham is famous for its work in metals, — iron, copper and brass. Among its best-known products are screws, nails, pens and firearms. **Sheffield** manufactures heavy iron goods and cutlery. **Bradford** is noted for its woolen manufactures. **Cambridge** and **Oxford** have famous universities. **Dublin** is the center of trade for middle Ireland. **Belfast** manufactures fine Irish linens.

Cardiff is the seat of the coal and the iron trade of southern Wales.

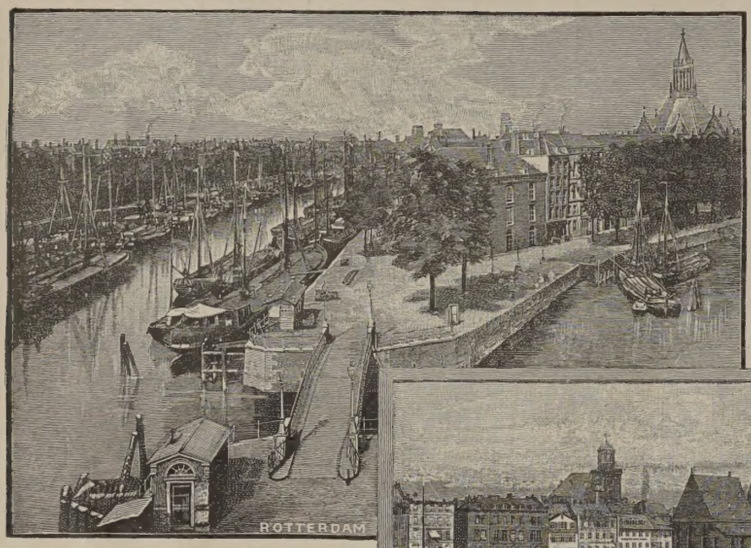
Edinburgh, the capital of Scotland, contains several colleges. **Dundee** has the largest linen mills in Great Britain.

169. Review and Map Studies.

GERMANY. What countries border on Germany? What seas form part of its boundary?

Describe the surface of Germany. *See lesson 84.* Name four rivers that flow across this country. What part of Germany is in the Danube basin?

What winds bring most of the rainfall of Germany? Name some of the products of this country.



FRANCE. Into what bodies of water do the Rhone, the Gironde and the Seine rivers flow? What strait separates France from England? What mountains partly separate France from Germany? Name the mountain range between France and Spain.

Describe the surface of France. *See lessons 77 and 84.* What are some of the products of this country? Where is Corsica?

BELGIUM, THE NETHERLANDS AND DENMARK. What empire is east of Belgium and the Netherlands? On what sea do they border?

Describe the surface of the land along the southeast shore of the North sea. *See lesson 84.*

ITALY. What mountains separate Italy from France and Switzerland? What country adjoins Italy on the northeast? Name the bodies of water which partly surround this peninsula.

Describe the Po valley, and name its principal products. *See lesson 79.* What have you learned about the Apennines? — About the slopes on the southwest of the Apennines? Locate Sicily and Sardinia. Name a volcano in Sicily.

BALKAN COUNTRIES. Between what four countries does the Danube flow? Where is Montenegro?

Name three seas that border on Turkey. What countries border on the Adriatic sea?

What have you learned about the surface of the countries in the Balkan peninsula? *See lesson 80.* Why is the coastline of Greece so irregular? Where is Candia?

SWITZERLAND. Describe the surface of Switzerland. *See lesson 77.* Name some of the products of this country. What countries surround Switzerland?

AUSTRIA-HUNGARY. What countries are on the north of Austria-Hungary? What sea is on the southwest?

Describe the river system which drains the greater part of this empire. Describe the plain of Hungary. *See lesson 81.* What mountain range forms part of the boundary between Roumania and the plain of Hungary?

170. Countries of Low Europe, — Western Part.

GERMANY. Germany has rich coal and iron mines, beds of clay for making porcelain, and sand for making glass. The river valleys of this country are famous for their wine grapes. Large areas are planted with sugar beets and with cereals.

This country imports cotton from the United States; wool and flax from Russia and Hungary; raw silk from Italy.

The principal manufactures of Germany are cloth, iron articles, beet sugar, glass and porcelain. Large quantities of these articles are sent to the United States. Besides cotton, our country sends grain, meat, petroleum and tobacco to Germany, — largely through the port of Hamburg.

Germany ranks second among commercial countries.

Berlin, the capital, is the third city in size in Europe. This city is a great trade center, and is the seat of a famous university.

Leipzig has a large university, and is noted for book-publishing. **Munich** and **Dresden** have great galleries of painting and sculpture.

Hamburg, on the tide water of the Elbe, is the leading port on the mainland of Europe.

FRANCE. The products and the industries of France resemble those of Germany, but the former country extends southward into the belt where the mulberry tree thrives.

Paris, the capital, is the third largest city in the world. It is situated on the Seine river, and is noted for its art galleries and fine buildings. This city is the railroad center of France.

Havre, at the mouth of the Seine, is the port of Paris. Steamers from Havre reach nearly all great seaports. Among the French exports to our country are silks, woolens and millinery goods. The United States sends about the same kinds of goods to Havre as to Hamburg.

Lisle is in the flax-growing region of northern France, and is near coal mines. This city has large mills for the manufacture of linen cloth and thread.

BELGIUM. Belgium has valuable coal mines, and is in the flax district. Laces and linen are important manufactures in this country.

Sugar beets are a leading crop in Belgium. Here are also beds of excellent sand for glass-making. The most

Among the articles sent from Paris to New York are leather goods, feathers, buttons, fans and jewelry.

Lyon, the center of the silk manufactures, is not far from the coal region of the Cevennes, nor from the silk-worm district of southern France.

Marseille is the largest port of this country. A canal from the Rhone river to this city makes it the chief port of the Rhone valley.

The Garonne basin produces great quantities of grapes. **Toulouse** is in the vineyard district. This city and **Bordeaux** are famous for red wines.

valuable exports from this country to the United States are beet sugar, glassware, cloth and firearms.

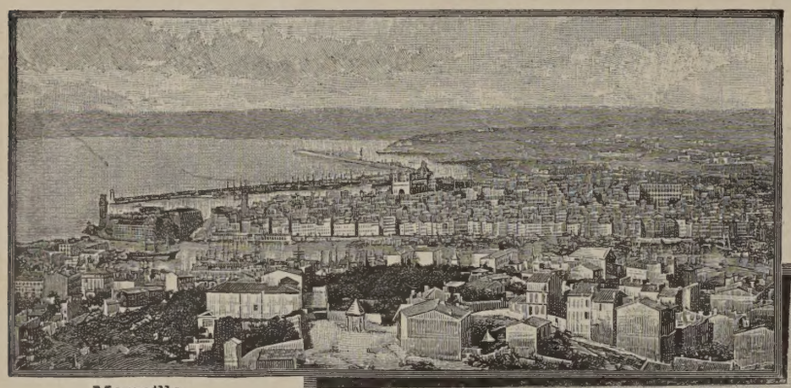
Antwerp, the chief port, is the center of the railroad and canal systems which reach nearly all parts of Belgium.

Brussels is noted for carpets and laces. **Liege** is well known for its firearms.

THE NETHERLANDS OR HOLLAND. The people of this country are largely engaged in dairying and in raising cereals. Holland has many colonies, among which are Java, Sumatra and Dutch Guiana. These colonies send tobacco, tea, coffee, sugar and spices to Holland.

Amsterdam and **Rotterdam** are important ports. Many skillful diamond-cutters live in these cities. Diamonds and tobacco are the principal exports from Holland to our country.

DENMARK. This country resembles Holland in its products. **Copenhagen** is the capital and principal city.



Marseille.

171. Mediterranean Countries.

SPAIN. **Madrid,** the capital and largest city of Spain, is in the central plateau.

Barcelona is the chief city of eastern Spain. This city exports fruits, olive oil, silk and wine. **Valencia** is noted for its fine silk manufactures. **Malaga** is a wine and fruit port.

PORTUGAL. **Lisbon** is the principal trade center of Portugal. This city, as well as **Oporto** farther north, has a large trade in wine and in olive oil.

ITALY. The leading exports of this country are silks, wine, oil and fruits. The imports are raw cotton, sugar, coffee and other food supplies.

Naples, on the beautiful bay of the same name, is the largest city in Italy.

Rome, the capital, contains the Vatican, or residence of the Pope; and St. Peter's, the largest cathedral in the world. This city is famous for its historic ruins.

Milan is the most important city in the Po valley. **Genoa** is the chief port of northwest Italy. **Florence and Venice** have famous art galleries.

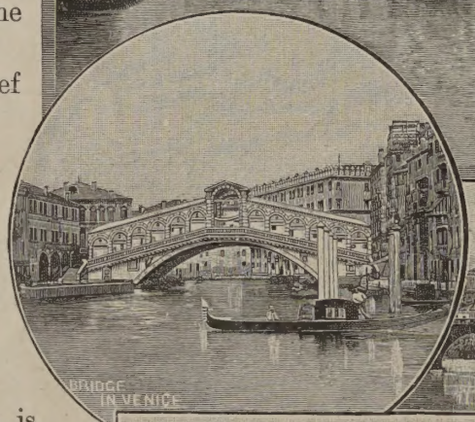
TURKEY AND GREECE. The trade of the United States with these two countries, as well as with the other Balkan states, is very small. **Constantinople** is the capital of the Ottoman Empire, including Turkey in Europe, Turkey in Asia, Egypt and Tripoli. The chief ruler, or *sultan,* is the head of the Mohammedan religion.

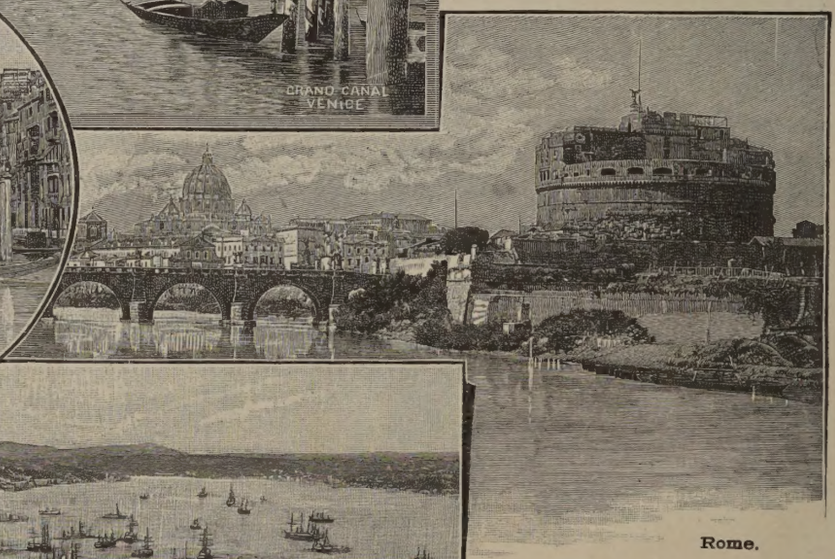
Athens, the capital of Greece, is famous for its history, and for the ruins of its ancient temples.

172. Other Countries of Europe.

SWITZERLAND. The swift streams of this country supply good water power. Here are also mines of brown coal, or *lignite.* Raw silk is brought from Italy; cotton from our country; flax from the countries of Low Europe. Switzerland manufactures laces, silks and cotton cloth. **Zurich** is the principal manufacturing city.

Geneva is noted for its watches, clocks and music boxes.



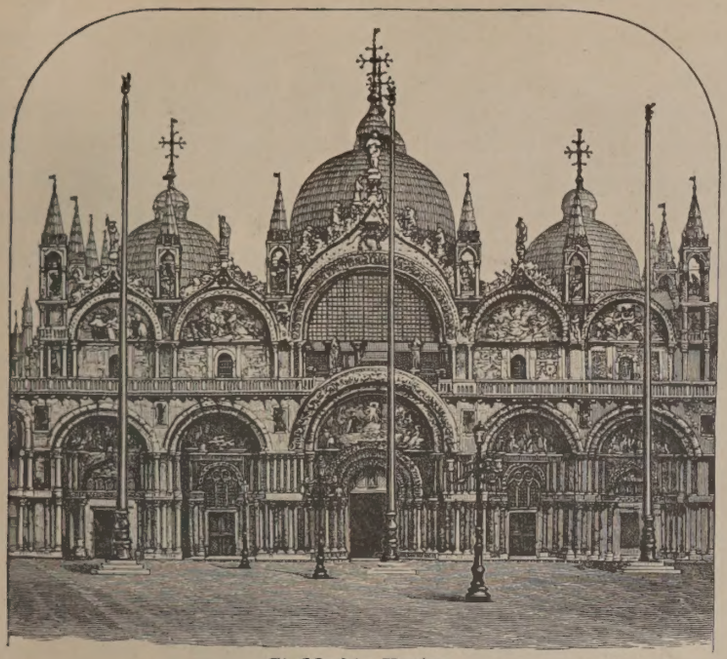


Rome.

Constantinople, on the Bosphorus.

Dairying and hotel-keeping are leading industries in Switzerland. Every summer thousands of tourists visit this country to see its mountains, glaciers, lakes and waterfalls.

AUSTRIA-HUNGARY. The fertile plain of Hungary yields grain, sugar beets and grapes. Cattle and sheep here find good pasturage. The surrounding highlands are rich in minerals. The higher slopes are forested.



St. Mark's, Venice.

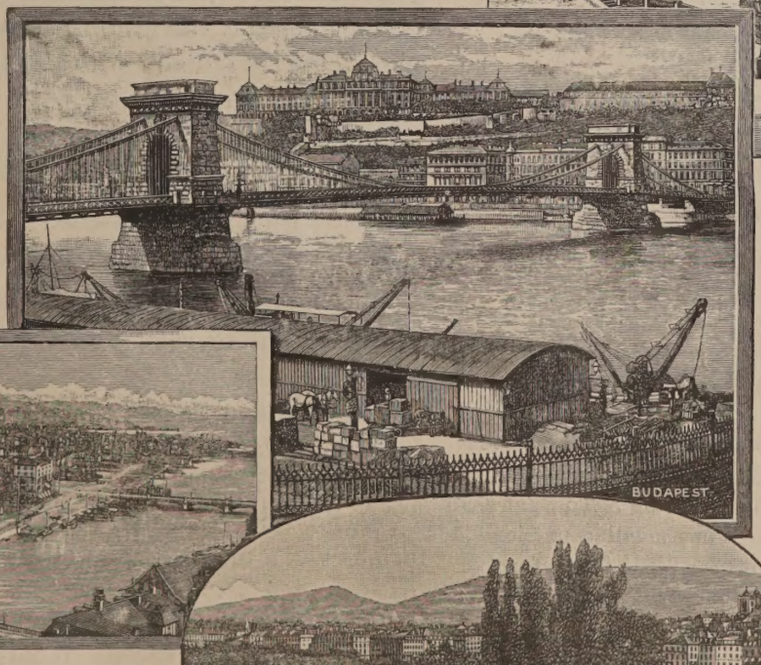
Vienna is the railroad center of the empire, and is also a river port. This city has one of the largest and best universities in the world.

Budapest, on the Danube, is the second city in importance in this country. It is the trade center of the plain of Hungary. **Trieste** is the principal port of the empire.

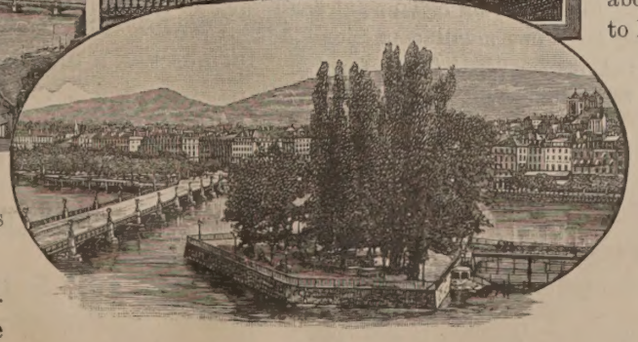
RUSSIA. **St. Petersburg** is the capital of the Russian Empire. Railroads and canals connect this city with the productive parts of the great plain of Russia. *See lesson 85.* The leading exports are wheat, flax, lumber and wool.

Moscow is the railroad center of the empire. This city has an immense trade, not only with other parts of European Russia, but also with Siberia.

The *Kremlin,* an old fortress in Moscow, covers about one hundred acres. Within its walls are several famous buildings.



Zurich.



Geneva.

Odessa and **Riga** are important ports. The former is the largest city on the Black sea and is a famous wheat port.

NORWAY AND SWEDEN. These countries form the Scandinavian peninsula. The United States has very little trade with either.

Christiania is the chief port of Norway. It has a large trade in lumber. **Bergen** is the second port of this country.

Stockholm is the principal city of Sweden. **Gottenborg** is the leading port.

One of the most important aids to commerce in Europe is the system of canals and rivers forming a network over the lowlands, and even uniting the large rivers in the highland region.

Canals from river to river cross the plain of Russia, so that boats can carry freight to almost every city and large town in the European portion of the empire. This great inland water system reaches the Caspian, the Black, the Baltic and the White seas, as well as the mining districts in the Ural mountain region. Most of the freight in Russia is carried by boats on the canals and rivers.

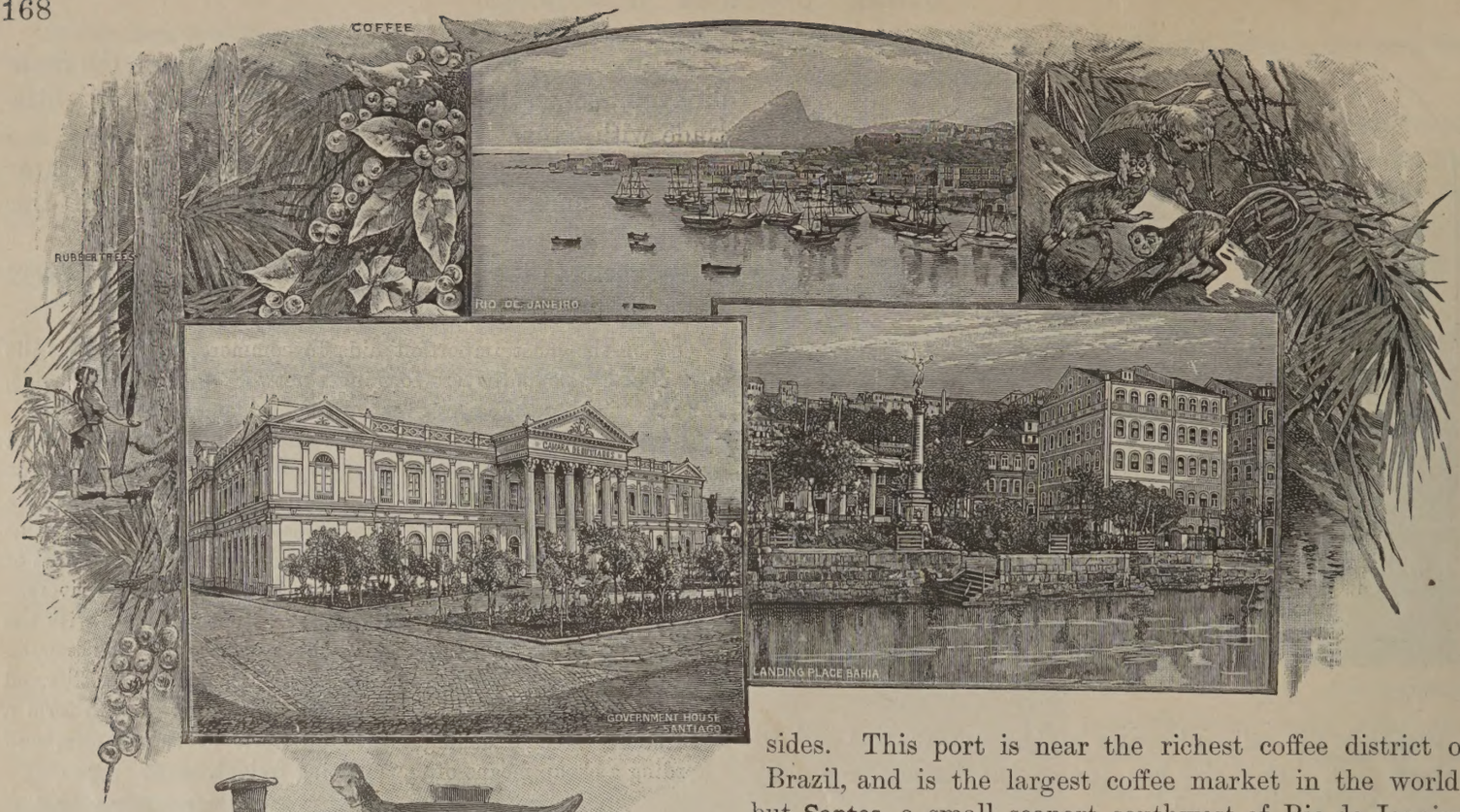
On the west, the inland water ways of Russia connect with the Vistula system. Boats from the Vistula can pass through tributaries and canals that lead into the Oder, and thence to the Elbe and the Rhine. All the large rivers of Germany thus help to form a connected system, reaching nearly all ports of the empire, and affording a cheap means of transporting freight.

Kremlin, Moscow.

The low countries of Belgium and Holland are crossed by many canals. From the Rhine valley, canals lead to the Seine, thence to the Loire, and to the Garonne. From the latter river, boats can follow the canal route to the Rhone river or to the Mediterranean sea.

On the rivers and canals named above, a boat can go from Marseille to Paris, Berlin, Hamburg, St. Petersburg, Moscow, or even to the port of Archangel on the White sea. The Rhine and the Danube are also connected by a canal in the highland region, thus completing the water route from the North sea to the Black sea, by way of the plain of Hungary.

In some countries more freight is carried on the canals than on the railroads.



PERUVIAN POTTERY

SOUTH AMERICA.

173. Review and Map Studies.

Describe the Andes of Chile; — of Bolivia and Peru; — of Ecuador and Colombia. *See lessons 57, 58 and 59.*

Describe the surface of Brazil; — of Argentina; — of Chile; — of Venezuela. *See lessons 60 to 64.*

Tell what you can about the climate and the products of the selvas; — of the llanos; — of the gran chaco and the pampas; — of the highland of Brazil.

Bound Chile. Between what two countries is lake Titicaca? Which countries of South America are crossed by the equator? What country includes the greater part of the Orinoco basin? Between what countries is the broad Plata mouth? Which countries of this continent do not border on Brazil? Which countries have no seacoast?

To which countries does Tierra del Fuego belong? To what empire do the Falkland islands belong? What small countries in South America belong to European nations? What is the form of government of all the countries of this continent, except the Guianas? *See lesson 103.*

174. Countries of South America.[1]

Brazil. **Rio de Janeiro,** the capital of this republic, is on a deep and spacious harbor, sheltered by hills on all sides. This port is near the richest coffee district of Brazil, and is the largest coffee market in the world; but **Santos,** a small seaport southwest of Rio de Janeiro, is a close rival.

Other exports from Rio de Janeiro are sugar, hides, tobacco and diamonds.

The principal imports into Brazil are cotton cloth and machinery.

Bahia, a large port northeastward from Rio de Janeiro, resembles the latter in its foreign trade.

Pernambuco is the leading sugar port of Brazil. This is one of the Brazilian ports partly inclosed by long rocky reefs. *See picture on page 58.*

Para is on one of the wide distributaries of the Amazon. This city has a large rubber trade.

Other exports from the Amazon basin, mostly through Pará, are cocoa, Brazil nuts, hides and Peruvian bark.

Argentina. The people of this republic are engaged chiefly in raising cattle, horses, sheep, wheat and Indian corn.

Buenos Aires, one of the principal ports of the continent, has a large foreign trade in hides, wool and wheat. The leading imports are cloth and railway materials.

Cordoba and **La Plata** are important trade centers. The former has a university and an academy of sciences.

Uruguay. A large part of this country is grazing land for cattle and sheep. Wool and hides are the principal exports.

Montevideo is the capital and the largest port.

Paraguay. In this small republic the most valuable product is Paraguay tea, or *yerba maté*. **Asuncion,** the capital, is the commercial center.

[1] Brazil was settled by Portuguese, and their language is still spoken there. Spanish is the language of the other countries except the Guianas.

CHILE. This republic has great mineral wealth. In the desert district of Atacama are found great quantities of niter, — a whitish salt used in the manufacture of gunpowder. Copper and silver are abundant in the northern half of Chile. Rich mines of coal are being worked in the southern half of this country.

The principal farming products of Chile are wheat and wine grapes.

Valparaiso is the chief port. Most of the imports, — such as cloth, cattle and sugar, — are received into this city. Large quantities of niter and copper are shipped from the northern seaport of **Iquique.**

Santiago is the capital and largest city of Chile. This is one of the Andean cities which are built far above the unhealthful coastal region. Santiago is in a wide valley on the western slope of the Andes, more than one third of a mile above sea level.

BOLIVIA. This country has rich mines of silver. Its rubber product is of the finest quality.

What have you read about cinchona? *See lesson 58.*

Bolivia has no seaport, but many of its products are exported through Buenos Aires, Arica (Chile), and other ports.

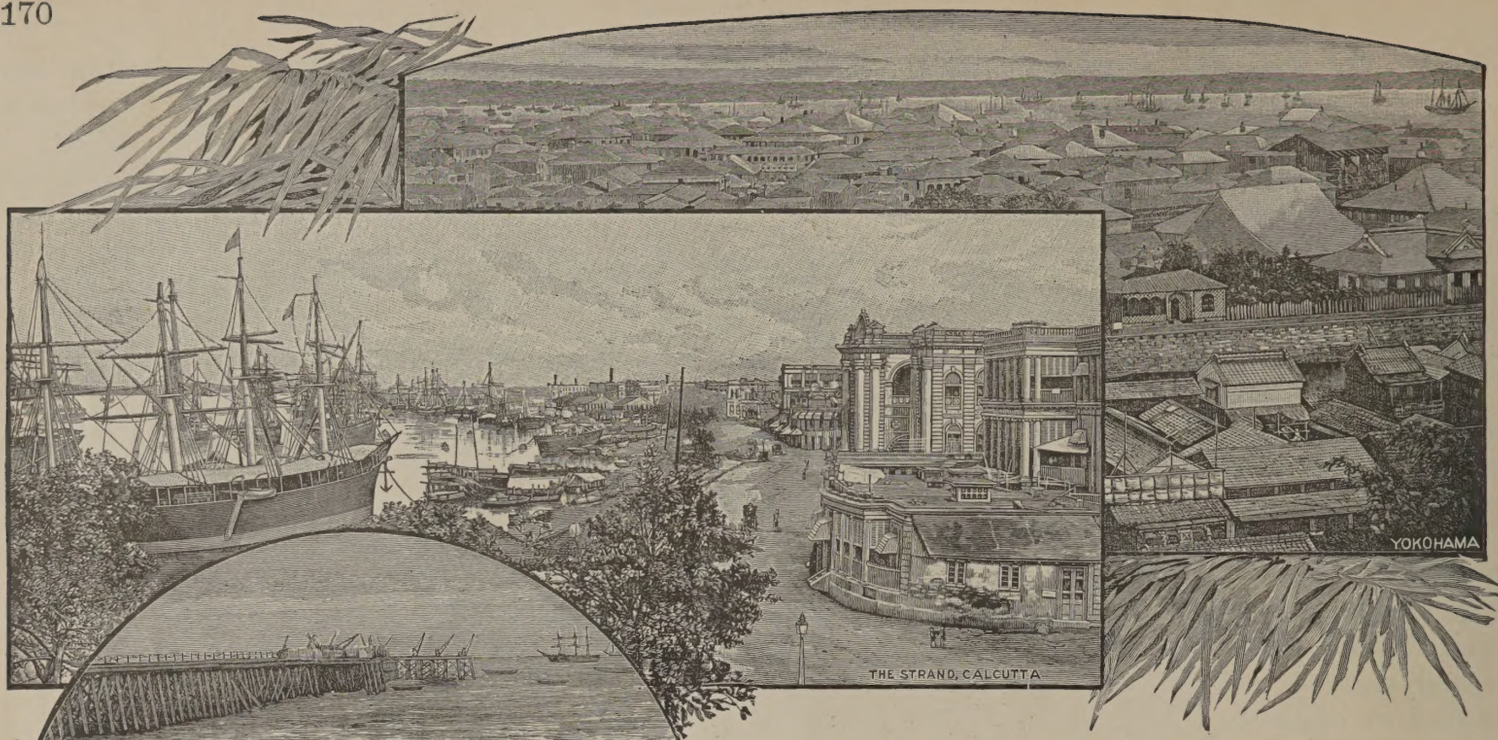
La Paz and **Sucre** are the principal cities. **Potosi** is noted for its silver mines.

PERU. Sugar cane and cotton are raised in the flood plains of the small rivers of western Peru. Sheep and alpacas are reared in the highlands. Sugar, cotton and wool are the leading exports. Cloth is the most valuable article of import.

Lima is the largest city of this country. **Callao** is one of the principal seaports of western South America.

ECUADOR. The staple product of Ecuador is cocoa. This country, like all the others crossed by the Andes, has rich mineral deposits.

Quito is the capital. **Guayaquil** is its seaport.



COLOMBIA. The leading export of this country is coffee. **Bogota,** the capital, is over a mile and a half above sea level. This country is very poor. It has for many years been the scene of civil wars. In the year 1903 its best department seceded and became the republic of Panama. *See page 53.*

VENEZUELA. Coffee is the most valuable export from Venezuela. Many hides are shipped from the Orinoco basin. **Caracas** and **Valencia** are the most important cities of this country.

GUIANA. The three colonies of Guiana are not thickly settled, and the value of their trade is not very great. Sugar is the leading export. The capitals of the colonies are the most important centers of trade.

ASIA.

175. Review and Map Studies.

There are five divisions of the Chinese Empire, namely: China, Tibet, Mongolia, Eastern Turkestan and Manchuria. Describe the surface, the climate and the products of each. *See lessons 72, 69 and 68.*

In like manner describe India (*see lesson 73*); — Siberia (*see lesson 71*); — Japan (*see lesson 74*); — Persia, Turkey and Arabia (*see lesson 70*); — Java, Sumatra and the Philippine islands (*see lesson 74*).

What country is on the north of the Chinese Empire? Where are Anam and Siam? What countries border on the Arabian sea? — On the Persian Gulf? — On the Caspian sea? What two countries are between India and Persia?

176. Countries of Asia.

INDIA. This country trades chiefly with Great Britain and with China. The most valuable exports from India are cotton and cotton seed, wheat, rice, opium, jute, tea and indigo. The principal imports are cotton cloth and hardware.

Calcutta and **Bombay** are the greatest seaports of India. The former is about as large as the city of Philadelphia.

Calcutta, the capital of India, is on the Hugli river, in the Ganges delta. This city is the principal shipping-point for the produce of the Ganges and the Brahmaputra basins. Railroads, rivers and canals form the inland highways

of trade to and from this great port. No large rivers carry products to Bombay, but the city is reached by railroads from nearly all parts of India. This port owes its rapid growth largely to its situation on the west coast, being much nearer than Calcutta to the Suez canal and the British Isles.

Madras is the largest seaport of southern India.

Benares is the chief seat of the Hindu religion, and is one of the oldest cities in the world. In this holy city of the Hindus, the north bank of the Ganges is lined with great temples.

Rangoon is the chief port of Burmese India. This city has a large trade in rice.

Delhi and **Mandalay** are large centers of trade in India. *See picture of old Delhi, page 68.*

Locate Colombo and Singapore. What have you learned about the latter city? *See lesson 144.* Ceylon and the Straits Settlements, as well as India, are British possessions.[1]

[1] France and Portugal control a few small colonies in the southern and western parts of the Dekkan.

FRENCH INDO-CHINA. French Indo-China includes Anam, Cochin-China, Cambodia and other provinces. All these are under the control of France.

The products of French Indo China are similar to those of British India. **Hanoi, Hue, Saigon** and **Pnum Penh** are the chief centers of trade.

SIAM. This country is ruled by a native king, — an absolute monarch. The resources of the country are poorly developed. Teak and rice are the principal products. **Bangkok** is the chief city.

EAST INDIES. Sumatra, Java, Celebes, and middle and southern Borneo are possessions of Holland. They are called the *Dutch East Indies.* Northwest Borneo is under the rule of the British nation. The United States controls the Philippine islands.

What have you learned about the islands named above? Locate Manila, Batavia and Makassar. *See map on page 175.*

CHINA. The British nation controls the greater part of China's foreign trade, though the United States has a

small share in it. The island of Hongkong, on the coast of China, is a British colony. It exports Chinese tea and silk; and imports opium, cotton cloth, sugar and flour for the great empire near by.

The United States imports tea and silk from China, — chiefly from the ports of **Shanghai, Canton** and **Fuchau.**

Peking, the capital, and Canton are the largest cities of the Chinese Empire. **Yarkand** is in the principal oasis of the province of Eastern Turkestan. **Lassa** is the chief city of Tibet.

JAPAN. Japan is the only limited monarchy in Asia, having its own ruler. All the other independent countries are absolute monarchies.

The exports of Japan are taken from its rice swamps, its silkworm nurseries and its tea farms. The imports are mostly cloth, metal goods and petroleum. Japanese trade is carried on chiefly with the United States and with Great Britain.

Cairo, Egypt.

Japan is the most progressive of Asiatic countries. The Japanese have good schools, railway and telegraph lines, and large manufactories. Among the latter are iron foundries, glass-works, paper mills, cotton and silk mills. The people of Japan are noted for the weaving of silk and the carving of ivory.

Tokyo is the capital and the commercial center of Japan. Only two cities in America are larger than Tokyo.

Yokohama, on the bay of Tokyo, is the chief seaport. **Osaka** is an important manufacturing city. **Kyoto** is surrounded by a great number of Buddhist temples.

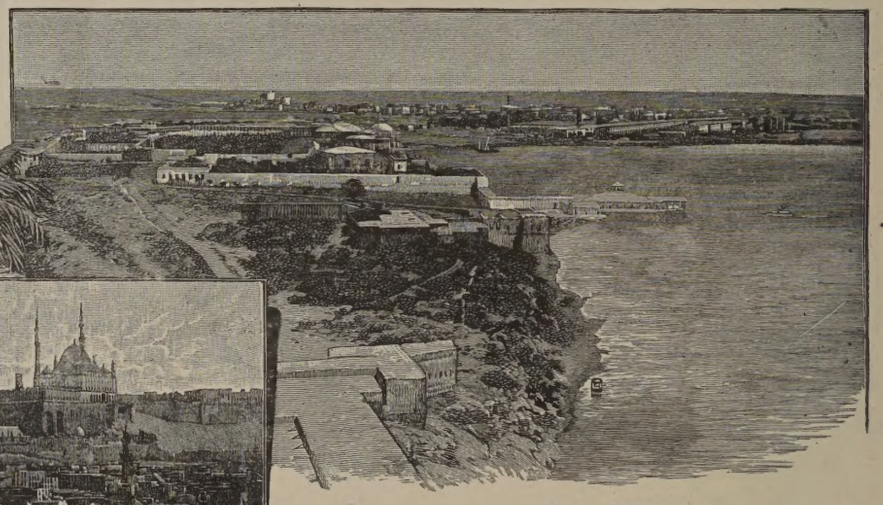
KOREA. The Japanese have recently won for Korea its freedom from Chinese authority. The foreign trade of this country is small, and is mostly in the hands of the Japanese. **Seoul** is the chief city of Korea.

By the terms of the China-Japanese treaty of 1895, Korea was made an independent kingdom, — an absolute monarchy.

RUSSIA IN ASIA. Siberia and Trans-Caucasia[1] are parts of the great Russian Empire, which comprises about one seventh of the land-surface of the earth. Bokhara and Khiva also are under the control of Russia.

Tashkend, the largest city in Asiatic Russia, is in a district made fertile by irrigation. **Tiflis** is a city through which Russia conducts a large part of its trade with Persia and other countries of southwest Asia. The railroad which carries great quantities of petroleum from **Baku** to the port of **Batum** passes through Tiflis.

Irkutsk and **Vladivostok** are centers of Siberian trade. The latter city is the Pacific port of Siberia, and the terminus of the Siberian railroad now being built. *See map of Asia in the Supplement.*



Alexandria.

PERSIA. Cereals and the opium-poppy grow in the fertile portions of Persia, chiefly in the districts near the Caspian sea. Many sheep are reared in the highland regions. Dates thrive along the coast, and pearls are obtained from the border waters on the south. The Persians are famous for their handmade carpets and rugs.

Teherân and **Tabriz** are the principal cities.

AFGHANISTAN. This country is crossed by the caravan routes that lead into India. **Kabul** is the chief city.

BALUCHISTAN is a rugged country under the control of the British. Most of the people are shepherds.

ASIATIC TURKEY. The products of this country are similar to those of Persia, but the Red sea coast is famous for its coffee. **Mocha** is the chief port for the shipment of this coffee. Mohammed was born in **Mekka.**

Smyrna is the largest city and port of Asiatic Turkey. **Damascus** has an extensive caravan trade with the Arabs.

Jerusalem is famous for its religious history.

ARABIA. Arabia, like Persia and Turkey, is a Mohammedan country. *See lesson 72.*

OMAN. **Maskat** exports dates, and imports rice.

[1] Trans-Caucasia is the name of the Asiatic portion of the large Russian province of Caucasus, lying on both sides of the Caucasus mountains.

177. Review and Map Studies.

Describe the Nile basin. *See lesson 88.* What part of this basin is in Egypt?—In Nubia? What European nation claims the region about the highland of Abyssinia?

Where is Tripoli? Where is Morocco? Describe the Sahara. *See lesson 89.* In what respect does the Sudan differ from the Sahara? *See lesson 90.*

Locate Liberia and Sierra Leone. What nation claims the region stretching northeastward from Liberia to the Mediterranean sea?

What state or country comprises the greater part of the Kongo basin? Between what two European claims is lake Victoria? What lake partly separates Kongo State from German East Africa? Where is the territory known as the French Kongo?

What European nation claims a broad coastal belt on both sides of the lower Zambezi? What name is given to the middle region of the Zambezi basin? What European nation controls Transvaal and Cape of Good Hope? *See lesson 92.*

Describe the surface and the products of Cape of Good Hope. Locate the Orange River Colony. What country is north of it?

What have you learned about Madagascar? *See lesson 92.* Locate the Madeira, the Canary and the Mauritius islands. For what is St. Helena noted? *See lesson 84.*

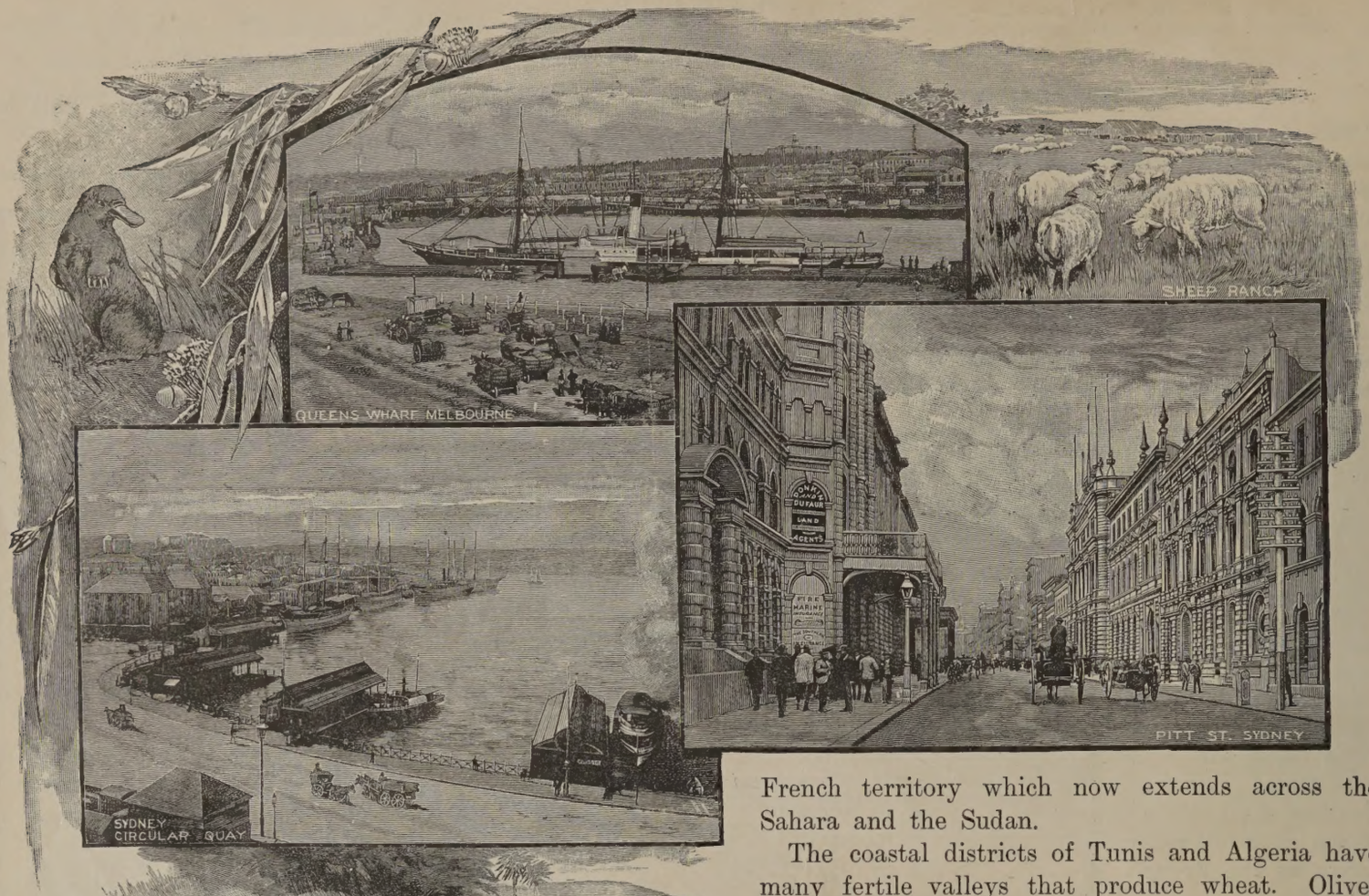
Locate Zanzibar, Tananarivo, Mozambique.

178. Countries of Africa.

EGYPT. This country is nominally part of the Ottoman Empire, though the Sultan of Turkey has very little control over the affairs of Egypt. The *Khedive*, or ruler, of Egypt resides in **Cairo**, the capital. This is one of the oldest cities in the world.

What have you learned about Cairo? *See page 90.* Compare the location of this city with that of New Orleans. Which is farther from the equator?

The principal exports of Egypt are cotton and cotton seed. The most valuable imports here, as in all other



African countries, are various kinds of cloth. Great Britain controls the greater part of the foreign trade of Egypt.

Alexandria, in the Nile delta, is the largest seaport of this country.

Before the discovery of the route from Europe to India by way of the cape of Good Hope, Alexandria was one of the greatest ports in the world. When the East India trade with western Europe was turned away from the Mediterranean sea, the port in the Nile delta rapidly declined. The building of the Suez canal has greatly increased the trade of Alexandria.

Tripoli. This portion of the Ottoman Empire is thinly settled. The population of the entire country of Tripoli is smaller than that of Philadelphia. The capital is the only important city.

Tunis and Algeria. These countries have been added to the possessions of France. They form part of the French territory which now extends across the Sahara and the Sudan.

The coastal districts of Tunis and Algeria have many fertile valleys that produce wheat. Olives grow here in abundance, and cattle and sheep find good grazing land. The cities of **Tunis** and **Algiers** export wheat, olive oil, wool and hides to France.

Morocco. The products of this country are similar to those of Algeria. **Fez** and **Morocco** are the principal cities of Morocco.

Sierra Leone. This small colony belongs to the British nation. **Freetown** exports palm oil.

Liberia. This is a negro republic settled largely by freed slaves from the United States. **Monrovia,** the capital, is named after a former President of our country. The chief exports from Monrovia are coffee and palm oil.

Kongo State. The King of Belgium is the ruler of the Kongo State. **Boma** is the local capital.

The most valuable exports of the Kongo State are coffee, rubber, ivory and palm oil.

Transvaal. Transvaal has rich gold fields. The white settlers are chiefly English and Dutch, or Boers. **Pretoria** is the capital. **Johannesburg** is in the heart of the gold region. Transvaal belongs to the British.

Cape of Good Hope is a large and valuable British possession. *See lesson 92.*

European nations have seized nearly all parts of Africa. Plate Q (supplement) shows the claims of each.

179. Review and Map Studies.

Describe the surface of Australia. Tell what you can about its climate. *See maps on pages 21 and 24; also lesson 93.*

In what part of Australia is the state of Victoria? Where is Queensland? What state is between Victoria and Queensland?

Which state occupies a broad belt stretching north and south across this continent? What name is given to the most westerly state in Australia? Locate Tasmania.

The principal exports from Australia are wool, gold and cereals. The most valuable imports are cloth and iron goods. The largest seaports are in the southeast. Dalgety is the capital of Australia.

Melbourne, the chief seaport of Victoria, is the largest city of Australia. Its population is almost as large as that of Boston. Melbourne has extensive manufactures.

Tell what you have learned about New Zealand; — New Guinea; — the Fiji islands; — the Tonga islands; — the Samoa islands; — Micronesia; — the Hawaiian islands. *See lesson 95.*

180. States of Australia.

The states in the southeastern part of this continent are the most thriving. Here are vast grazing districts that support millions of sheep and cattle. Large areas are planted with wheat, Indian corn and other cereals. Great quantities of gold and tin are mined. Middle and western Australia are thinly settled.

Sydney, the principal port of New South Wales, is on a long and deep landlocked bay. This is the oldest and the second largest city in Australia.

Adelaide is the commercial center of South Australia. **Brisbane,** on the river of the same name, is the capital and leading port of Queensland. **Hobart** is an important port of Tasmania.

New Zealand. The most valuable exports from New Zealand are wool, gold and frozen meat. **Dunedin** is the chief port of the South island; **Auckland,** of the North island. **Wellington** is the capital.

SUPPLEMENT

AREA AND POPULATION OF PRINCIPAL COUNTRIES AND COLONIES.

NORTH AMERICA		**8,000,000**	**100,000,000**
Year.		Area.	Population.
1901	Canada	3,446,000	5,370,000
1903	Costa Rica	18,000	323,000
1904	Cuba	44,000	1,730,000
1903	Guatemala	48,000	1,842,000
1904	Haiti (island)	28,000	1,600,000
1901	Honduras	46,000	587,000
1900	Mexico	767,000	13,600,000
1903	Newfoundland	40,000	220,000
1900	Nicaragua	49,200	500,000
1901	Salvador	7,200	1,007,000
1900	United States	3,622,930	76,303,387[1]
1904	Panama	31,570	350,000
SOUTH AMERICA		**7,000,000**	**36,500,000**
1904	Argentina	1,135,000	5,161,000
1904	Bolivia	703,000	2,181,000
1904	Brazil	3,218,000	16,000,000
1904	British Guiana	91,000	295,000
1901	Chile	308,000	3,147,000
1904	Colombia	473,000	3,917,000
1903	Dutch Guiana	46,000	72,000
1904	Ecuador	116,000	1,206,000
1904	French Guiana	31,000	33,000
1900	Paraguay	157,000	636,000
1904	Peru	696,000	4,600,000
1902	Uruguay	72,000	978,000
1904	Venezuela	594,000	2,500,000

EUROPE		**3,800,000**	**360,000,000**
Year.		Area.	Population.
1900	Austria-Hungary	265,000	47,013,000
1900	Belgium	11,400	6,694,000
1900	Bulgaria	38,000	3,733,000
1901	Denmark	15,300	2,465,000
1901	England	50,800	38,962,000
1901	France	207,000	38,641,000
1900	Germany	209,000	56,367,000
1901	Greece	28,000	2,737,000
1901	Ireland	32,600	4,456,000
1901	Italy	110,600	32,475,000
1902	Netherlands	12,600	5,431,000
1900	Norway	125,000	2,240,000
1900	Portugal	35,500	5,423,000
1900	Roumania	50,700	5,956,000
1904	Russia	2,100,000	116,000,000
1901	Scotland	29,700	4,472,000
1900	Servia	19,000	2,494,000
1900	Spain	195,000	18,618,000
1903	Sweden	173,000	5,221,000
1900	Switzerland	16,000	3,315,000
1905	European Turkey	66,000	6,130,000
1901	Wales	7,400	1,698,000
ASIA		**17,000,000**	**850,000,000**
1904	Afghanistan	250,000	5,000,000
1904	Arabia	170,000	1,050,000
1900	Baluchistan	130,000	500,000
1904	Chinese Empire	4,376,000	426,337,000
1901	India (British)	1,560,000	294,267,000
1900	Indo-China (French)	263,000	15,600,000
1903	Japan	148,000	46,733,000

Year.		Area.	Population.
1900	Java	51,000	26,125,000
1904	Korea	82,000	10,000,000
1900	Persia	628,000	7,653,000
1900	Philippines	128,000	7,635,000
1904	Russia in Asia	6,560,000	28,000,000
1900	Siam	220,000	9,000,000
1904	Asiatic Turkey	523,000	15,849,000
AFRICA		**11,500,000**	**130,000,000**
1904	Abyssinia	150,000	3,500,000
1904	Algeria	185,000	5,304,000
1904	Cape of Good Hope	277,000	2,405,000
1897	Egypt	400,000	9,734,000
1904	Kongo State	900,000	30,000,000
1904	Liberia	45,000	2,000,000
1904	Madagascar	224,500	3,000,000
1901	Morocco	220,000	8,000,000
1904	Orange River Colony	50,000	385,000
1904	Sahara	2,000,000	2,550,000
1895	Sudan	2,000,000	50,000,000
1904	Transvaal	111,000	1,245,000
1904	Tripoli	399,000	1,000,000
1904	Tunis	51,000	1,900,000
OCEANIA		**3,500,000**	**6,000,000**
1901	Hawaii	6,450	154,000
1901	New South Wales	310,700	860,000
1901	New Zealand	104,500	768,000
1901	Queensland	668,500	503,000
1901	South Australia	904,000	362,000
1901	Victoria	88,000	1,200,000
1901	West Australia	976,000	182,000

POPULATION OF THE PRINCIPAL CITIES OF THE WORLD.

NORTH AMERICA.

British America.

Year.		Population.
1901	Montreal	267,000
1901	Toronto	208,000
1901	Quebec	69,000
1901	Ottawa	60,000
1901	Hamilton	53,000
1901	Winnipeg	42,000
1901	Halifax	41,000
1901	St. John	41,000
1901	London	38,000
1891	St. Johns	29,000
1901	Vancouver	26,000
1901	Victoria	21,000

Central America.

1904	Guatemala	96,000
1901	San Salvador	60,000
1900	Leon	45,000
1900	Managua	30,000
1902	Panama	28,000
1900	San Jose	25,000

Mexico.

1900	Mexico	345,000
1900	Guadalajara	101,000

United States.

See page iv.

West Indies.

1902	Havana	275,000
1903	Port au Prince	70,000
1902	Kingston	47,000
1902	Santiago	43,000
1902	Matanzas	36,000
1902	Cienfuegos	30,000

SOUTH AMERICA.

Argentina.

1904	Buenos Aires	965,000
1901	La Plata	75,000
1901	Cordoba	50,000

Bolivia.

1904	La Paz	60,000
1904	Sucre	21,000

Brazil.

1900	Rio de Janeiro	750,000
1890	Bahia	174,000
1890	Pernambuco	112,000
1890	Para	40,000

Chile.

Year.		Population.
1901	Santiago	297,000
1901	Valparaiso	133,000

Colombia.

1902	Bogota	120,000
1902	Barranquilla	40,000

Ecuador.

1901	Quito	80,000
1901	Guayaquil	51,000

Guiana.

1891	Georgetown	53,000
1902	Paramaribo	32,000
1900	Cayenne	12,000

Paraguay.

1900	Asuncion	52,000

Peru.

1903	Lima	130,000
1903	Arequipa	40,000
1903	Callao	20,000
1903	Cuzco	15,000

Uruguay.

1902	Montevideo	276,000

Venezuela.

1894	Caracas	73,000
1894	Valencia	39,000
1894	Maracaibo	34,000

EUROPE.

Austria-Hungary.

1901	Vienna	1,675,000
1901	Budapest	733,000
1901	Prague	202,000
1901	Trieste	134,000

Belgium.

1902	Brussels	587,000
1902	Antwerp	287,000
1902	Liege	166,000
1902	Ghent	163,000

Balkan States.

1904	Constantinople	1,203,000
1904	Bukharest	276,000
1896	Athens	111,000
1904	Saloniki	105,000
1904	Sofia	68,000

Denmark.

Year.		Population.
1901	Copenhagen	378,000

England and Wales.

1904	London	4,649,000
1904	Liverpool	723,000
1904	Manchester	558,000
1904	Birmingham	538,000
1904	Leeds	450,000
1904	Sheffield	433,000
1904	Bristol	343,000
1904	Bradford	285,000
1904	Cardiff	176,000

France.

1901	Paris	2,714,000
1901	Marseille	491,000
1901	Lyon	459,000
1901	Bordeaux	257,000
1901	Lisle	211,000
1901	Toulouse	150,000
1901	Havre	130,000

Germany.

1900	Berlin	1,889,000
1900	Hamburg	706,000
1900	Munich	500,000
1900	Leipzig	456,000
1900	Breslau	423,000
1900	Dresden	396,000
1900	Cologne	373,000

Ireland.

1901	Belfast	349,000
1901	Dublin	291,000
1901	Cork	76,000
1901	Londonderry	40,000

Italy.

1901	Naples	564,000
1901	Milan	491,000
1901	Rome	463,000
1901	Turin	336,000
1901	Palermo	310,000
1901	Genoa	235,000
1901	Florence	205,000
1901	Venice	152,000

Netherlands.

1903	Amsterdam	547,000
1903	Rotterdam	357,000
1903	The Hague	230,000

Norway and Sweden.

1903	Stockholm	311,000
1900	Christiania	228,000
1903	Gottenborg	135,000
1900	Bergen	72,000

Portugal.

Year.		Population.
1900	Lisbon	357,000
1900	Oporto	168,000

Russia.

1897	St. Petersburg	1,313,000
1897	Moscow	1,092,000
1897	Warsaw	756,000
1897	Odessa	450,000
1897	Riga	256,000

Scotland.

1904	Glasgow	798,000
1904	Edinburgh	332,000
1904	Dundee	164,000

Spain.

1900	Madrid	540,000
1900	Barcelona	533,000
1900	Valencia	213,000
1900	Malaga	130,000

Switzerland.

1904	Zurich	169,000
1904	Basel	121,000
1904	Geneva	111,000
1904	Bern	69,000

ASIA.

Asiatic Russia.

1897	Tiflis	160,000
1897	Baku	179,000
1897	Tashkend	156,000
1897	Irkutsk	49,000

British India.

1901	Calcutta	1,027,000
1901	Bombay	776,000
1901	Madras	509,000
1901	Haidarabad	448,000
1901	Lucknow	264,000
1901	Rangoon	235,000
1901	Delhi	209,000
1901	Benares	209,000
1901	Mandalay	184,000
1901	Singapore	163,000

China.

1903	Peking	1,000,000
1903	Canton	880,000
1903	Tientsin	750,000
1903	Hankau	700,000
1903	Fuchau	624,000
1903	Shanghai	620,000

East India Islands.

1903	Manila	220,000
1900	Soerabaya	147,000
1900	Batavia	116,000

French Indo-China.

Year.		Population.
1900	Hanoi	150,000
1900	Hue	50,000
1900	Saigon	37,000

Japan.

1902	Tokyo	1,819,000
1902	Osaka	996,000
1902	Kyoto	381,000
1902	Yokohama	326,000

Korea.

1901	Seoul	197,000

Siam.

1900	Bangkok	350,000

Southwest Asia.

1904	Teheran	280,000
1904	Damascus	225,000
1904	Smyrna	201,000
1904	Tabriz	200,000
1904	Bagdad	145,000
1904	Aleppo	127,000
1904	Ispahan	70,000
1904	Mekka	60,000
1904	Kabul	60,000
1904	Kandahar	50,000
1904	Jerusalem	42,000
1904	Herat	30,000

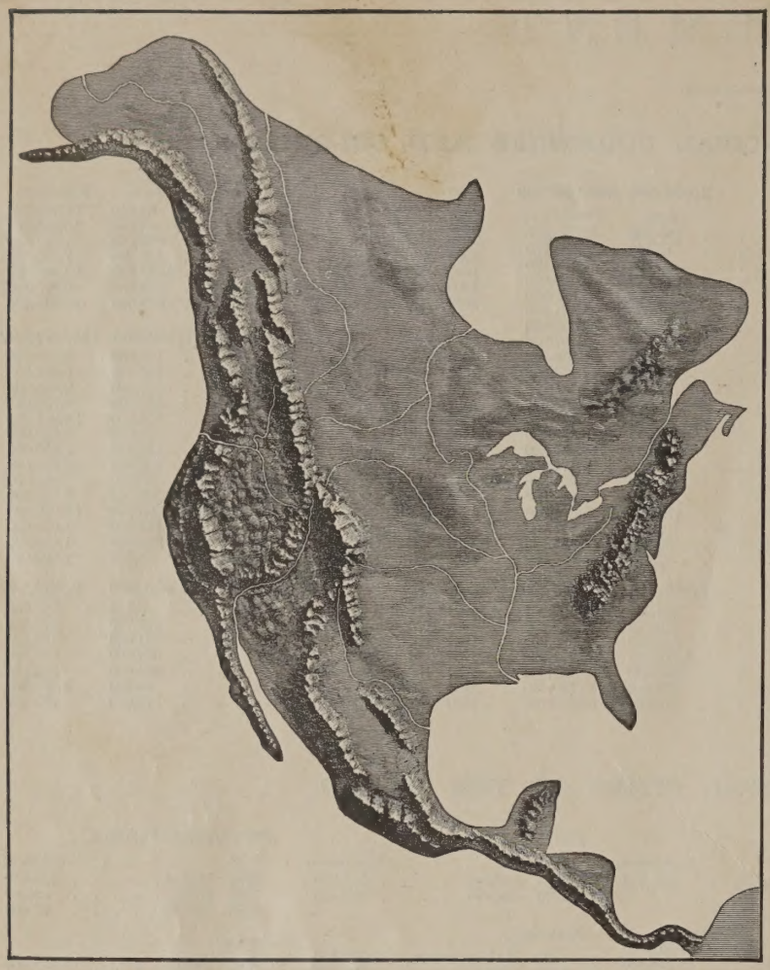
AFRICA.

1904	Cairo	575,000
1904	Alexandria	330,000
1901	Tunis	170,000
1904	Johannesburg	159,000
1900	Fez	140,000
1901	Algiers	97,000
1904	Oran	88,000
1904	Cape Town	77,000
1904	Kuka	60,000
1904	Tananarivo	55,000
1904	Morocco	50,000
1904	Port Said	50,000
1904	Zanzibar	50,000
1904	Kimberley	34,000
1904	Freetown	34,000
1904	Tangier	30,000
1904	Tripoli	30,000
1904	Monrovia	6,000

OCEANIA.

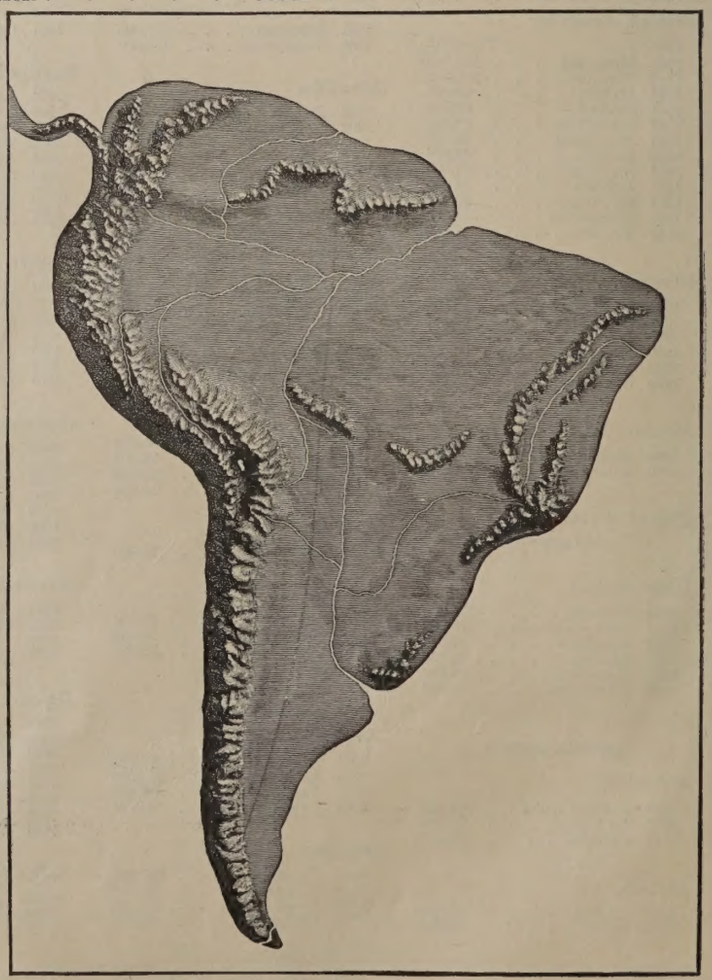
1903	Melbourne	501,000
1901	Sydney	488,000
1901	Adelaide	162,000
1903	Brisbane	125,000
1901	Wellington	40,000
1901	Auckland	39,000
1900	Honolulu	39,000
1901	Dunedin	38,000
1901	Hobart	25,000

[1] Exclusive of the island possessions (except Hawaii) and inclusive of 91,219 persons in the service of the United States stationed abroad.



Rivers, — Lengths and Drainage Areas.[1]

Name.	System.	Length in Miles.	Basin Area Sq. Miles.
NORTH AMERICA.			
Colorado	Pacific	2,000	230,000
Columbia	Pacific	1,400	220,000
Mackenzie	Arctic	2,400	440,000
Missouri-Mississippi	Atlantic	4,200	1,200,000
Nelson	Atlantic	1,800	355,000
Rio Grande	Atlantic	1,800	180,000
St. Lawrence	Atlantic	1,030	300,000
Yukon	Pacific	2,050	440,000
SOUTH AMERICA.			
Amazon	Atlantic	3,300	2,500,000
Plata	Atlantic	2,950	1,250,000
Orinoco	Atlantic	1,500	350,000
San Francisco	Atlantic	1,680	190,000
EUROPE.			
Danube	Atlantic	1,800	300,000
Dnieper	Atlantic	1,230	175,000
Dwina	Arctic	700	140,000
Elbe	Atlantic	550	42,000
Rhine	Atlantic	960	65,000
Rhone	Atlantic	550	33,000
Seine	Atlantic	497	23,000
Thames	Atlantic	215	6,000
Volga	Interior	2,300	550,000
ASIA.			
Amur	Pacific	1,500	600,000
Brahmaputra	Indian	2,000	425,000
Ganges	Indian	1,500	400,000
Hoangho	Pacific	2,700	540,000
Indus	Indian	2,000	320,000
Lena	Arctic	2,550	600,000
Ob	Arctic	2,500	920,000
Yangtze	Pacific	3,000	700,000
AFRICA.			
Kongo	Atlantic	2,900	1,500,000
Niger	Atlantic	3,500	600,000
Nile	Atlantic	3,700	1,600,000
Zambezi	Indian	1,800	440,000



Guide Maps for Drawing and Modeling the Continents.

The relief maps on this page and on the two following pages are intended as guides for drawing and modeling the continents. These maps are purposely made very simple, yet they show the natural features which exert the greatest influence upon the distribution of climates, plants and animals.

Pupils should learn to sketch these maps from memory, without the aid of straight guide-lines, except such as they themselves invent.

The *Teachers' Manual* offers suggestions upon methods of drawing and modeling the continents.

Areas of Continents and Oceans.

	Square Miles.		Square Miles.
North America	8,000,000	Pacific	68,000,000
South America	6,850,000	Atlantic	35,000,000
Europe	3,800,000	Indian	28,000,000
Asia	17,000,000	Antarctic	5,700,000
Africa	11,500,000	Arctic	5,300,000
Australia	3,500,000	Inland Waters	750,000

Total Population of the World, 1,500,000,000.

Caucasian	690,000,000	Christians	400,000,000
Mongolian	600,000,000	Buddhists	500,000,000
Negro	150,000,000	Mohammedans	200,000,000
Malay	35,000,000	Bramanists	150,000,000
American	12,000,000	Jews	8,000,000
Mixed Races	13,000,000	Pagans and others	242,000,000

[1] The lengths of rivers, and the areas of their basins, are in all cases estimates. Those of Africa are least known. The basin of the Murray river, in Australia, is thought to contain about 500,000 square miles. The area of the Yukon basin cannot now be closely estimated.

Indian Reservations in the United States.

States and Territories.	Area of Indian Reservations.		Population on Reservations (Indians).
	Acres.	Square Miles.	
Arizona	15,150,757	23,673	40,189
California	406,396	635	11,341
Colorado	—	—	995
Florida	—	—	575
Idaho	1,364,500	2,132	3,557
Indian Territory (see Oklahoma)			
Iowa	2,965	4	385
Kansas	28,279	44	1,211
Michigan	8,317	13	7,557
Minnesota	1,566,707	2,447	8,952
Montana	9,500,700	14,845	10,076
Nebraska	74,592	116	3,854
Nevada	954,135	1,491	8,321
New Mexico	1,667,485	2,605	9,480
New York	87,677	137	5,334
North Carolina	98,211	153	1,436
North Dakota	3,701,724	5,784	8,276
Oklahoma	26,397,237	41,245	100,191
Oregon	1,300,225	2,031	4,063
South Dakota	8,991,791	14,049	19,212
Texas	—	—	290
Utah	2,039,040	3,186	2,115
Washington	2,333,574	3,646	9,827
Wisconsin	381,061	595	10,726
Wyoming	1,810,000	2,828	1,642
Miscellaneous	—	—	849
Total, 1900	77,865,373	121,665	270,544
Total, 1880	154,741,349	241,800	255,327

Heights of Principal Mountains.

NORTH AMERICA.

Name.	Location.	Height in feet.
Mercedario	Mexico	22,397
Mt. McKinley	Alaska	20,464
Mt. Logan	Canada	19,539
Mt. St. Elias	Canada	18,024
Popocatepetl	Mexico	17,748
Dickerman	Washington	15,766
Mt. Whitney	California	14,502
Blanca peak	Colorado	14,464
Mt. Rainier	Washington	14,444
Mt. Shasta	California	14,380
Longs peak	Colorado	14,271
Mt. Holy Cross	Colorado	14,176
Pikes peak	Colorado	14,108
Fremonts peak	Wyoming	13,576
Mt. Wrangell	Alaska	12,066
Mt. Hood	Oregon	11,934
Mt. Mitchell	North Carolina	6,711
Mt. Washington	New Hampshire	6,279
Mt. Marcy	New York	5,467
Mt. Katahdin	Maine	5,385
Jorullo	Mexico	4,265

SOUTH AMERICA.

Aconcagua	Chile	23,083
Chimborazo	Ecuador	20,498
Arequipa	Peru	20,320
Cotopaxi	Ecuador	18,880
Tolima	Colombia	18,069
Roraima	Venezuela	7,874
Itacolumi	Brazil	5,740
Itambe	Brazil	4,300

EUROPE.

Elburz	Russia	18,526
Mt. Blanc	France	15,780
Monte Rosa	Italy	15,208
Olympus	Turkey	9,745
Etna	Sicily	9,652
Ymesfield	Norway	8,543
Ben-Nevis	Scotland	4,368
Vesuvius	Italy	4,260
Snowdon	Wales	3,571
Stromboli	Lipari Islands	3,090

ASIA.

Mt. Everest	India	29,002
Dapsang	Tibet	28,278
Kanchanjanga	India	28,156
Demavend	Persia	18,500
Ararat	Turkey	17,260
Mt. Hermon	Palestine	11,000
Mt. Sinai	Turkey	8,593

AFRICA.

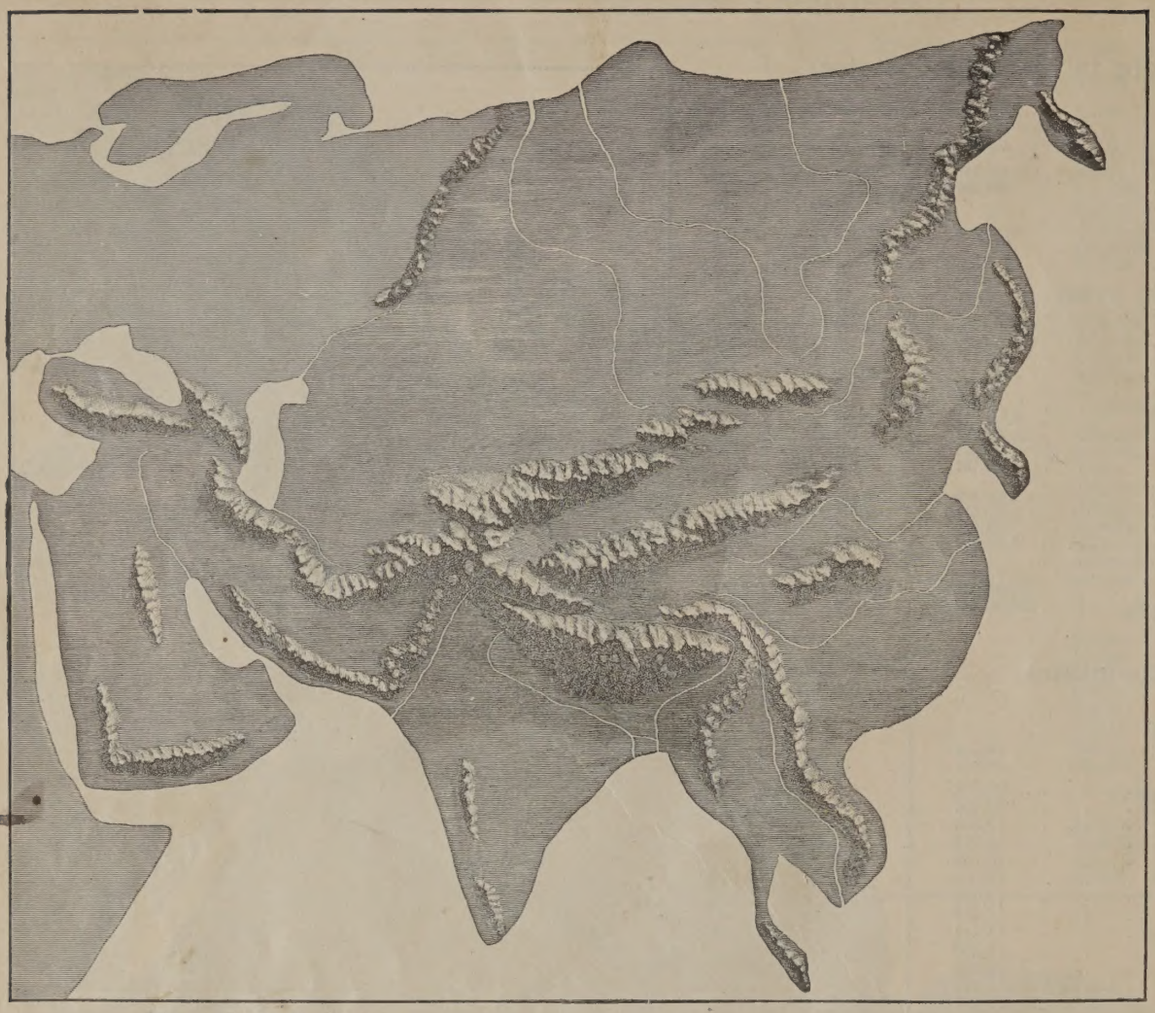
Kilimanjaro	East Africa	19,600
Kenia	East Africa	19,500
Tenerife	Canary Islands	12,000
Mt. Miltsin	Morocco	11,400
Peak of Pico	Azores	7,013

OCEANIA.

Mauna Loa	Hawaiian Islands	13,600
Mt. Kosciusco	Australia	7,176
Kilauea	Hawaiian Islands	4,040

Principal Lakes of the World.

Name.	Area in Sq. Miles.	Elevation in Feet.	Depth in Feet.
Aral Sea	26,000	48	. . .
Caspian Sea	170,000	— 84	3,000
Dead Sea	320	— 1,312	700
Great Salt Lake	2,600	4,200	60
Lake Baikal	12,500	1,600	4,500
Lake Chapala	1,300	7,000	. . .
Lake Erie	7,750	573	210
Lake Huron	20,000	581	700
Lake Ladoga	7,000	55	730
Lake Michigan	22,000	581	870
Lake Nicaragua	3,650	130	240
Lake Ontario	6,950	247	730
Lake Superior	31,500	602	1,108
Lake Titicaca	4,000	12,874	. . .
Lake Victoria	40,000	3,300	. . .



The United States.

States and Territories.	Area in Square Miles.	Population (1900).
Alabama	52,250	1,828,697
Alaska	590,884	63,592
Arizona	113,020	122,931
Arkansas	53,850	1,311,564
California	158,360	1,485,053
Colorado	103,925	539,700
Connecticut	4,990	908,420
Delaware	2,050	184,735
District of Columbia	70	278,718
Florida	58,680	528,542
Georgia	59,475	2,216,331
Guam[1]	175[2]	9,000[2]
Hawaii	6,449	154,001
Idaho	84,800	161,772
Illinois	56,650	4,821,550
Indiana	36,350	2,516,462
Indian Territory (see Oklahoma)		
Iowa	56,025	2,231,853
Kansas	82,080	1,470,495
Kentucky	40,400	2,147,174
Louisiana	48,720	1,381,625
Maine	33,040	694,466
Maryland	12,210	1,188,044
Massachusetts	8,315	2,805,346
Michigan	58,915	2,420,982
Minnesota	83,365	1,751,394
Mississippi	46,810	1,551,270
Missouri	69,415	3,106,665
Montana	146,080	243,329
Nebraska	77,510	1,066,300
Nevada	110,700	42,335
New Hampshire	9,305	411,588
New Jersey	7,815	1,883,669
New Mexico	122,580	195,310
New York	49,170	7,268,894
North Carolina	52,250	1,893,810
North Dakota	70,795	319,146
Ohio	41,060	4,157,545
Oklahoma	70,430	790,391
Oregon	96,030	413,536
Pennsylvania	45,215	6,302,115
Philippine Islands	127,853	7,635,426
Porto Rico[1]	3,600[3]	953,243[3]
Rhode Island	1,250	428,556
South Carolina	30,570	1,340,316
South Dakota	77,650	401,570
Tennessee	42,050	2,020,616
Texas	265,780	3,048,710
Tutuila Islands[1]	73[2]	6,000[2]
Utah	84,970	276,749
Vermont	9,565	343,641
Virginia	42,450	1,854,184
Washington	69,180	518,103
West Virginia	24,780	958,800
Wisconsin	56,040	2,069,042
Wyoming	97,890	92,531

States Having the Largest Negro Population.

States.	1900.
Georgia	1,034,813
Mississippi	907,630
Alabama	827,307
South Carolina	782,321
Virginia	660,722
Louisiana	650,804
North Carolina	624,469
Texas	620,722
Tennessee	480,243
Arkansas	366,856

Leading Cities of the United States.

Cities.	Population (1900).
New York, N. Y.	3,437,202
Chicago, Ill.	1,698,575
Philadelphia, Pa.	1,293,697
St. Louis, Mo.	575,238
Boston, Mass.	560,892
Baltimore, Md.	508,957
Cleveland, Ohio	381,768
Buffalo, N. Y.	352,387
San Francisco, Cal.	342,782
Cincinnati, Ohio	325,902
Pittsburg, Pa.	321,616
New Orleans, La.	287,104
Detroit, Mich.	285,704
Milwaukee, Wis.	285,315
Washington, D. C.	278,718
Newark, N. J.	246,070
Jersey City, N. J.	206,433
Louisville, Ky.	204,731
Minneapolis, Minn.	202,718
Providence, R. I.	175,597
Indianapolis, Ind.	169,164
Kansas City, Mo.	163,752
St. Paul, Minn.	163,065
Rochester, N. Y.	162,608
Denver, Colo.	133,859
Toledo, Ohio	131,822
Allegheny, Pa.	129,896
Columbus, Ohio	125,560
Worcester, Mass.	118,421
Syracuse, N. Y.	108,374
New Haven, Conn.	108,027
Paterson, N. J.	105,171
Fall River, Mass.	104,863
St. Joseph, Mo.	102,979
Omaha, Neb.	102,555
Los Angeles, Cal.	102,479
Memphis, Tenn.	102,320
Scranton, Pa.	102,026
Lowell, Mass.	94,969
Albany, N. Y.	94,151
Cambridge, Mass.	91,886
Portland, Ore.	90,426
Atlanta, Ga.	89,872
Grand Rapids, Mich.	87,565
Dayton, Ohio	85,333
Richmond, Va.	85,050
Nashville, Tenn.	80,865
Seattle, Wash.	80,671

[1] Not included in National Census of 1900. [2] Estimated. [3] Census of 1899 taken under the direction of War Department.

Cities and Towns of the United States

Having a Population of over 10,000. (CENSUS OF 1900.)

Adams, Mass.	11,134	Cripple Creek, Col.	10,147	Jacksonville, Ill.	15,078	Muskegon, Mich.	20,818	Rutland, Vt.	11,499
Akron, O.	42,728	Cumberland, Md.	17,128	Jamestown, N.Y.	22,892	**Nanticoke,** Pa.	12,116	**Sacramento,** Cal.	29,282
Alameda, Cal.	16,464	**Dallas,** Tex.	42,638	Janesville, Wis.	13,185	Nashua, N.H.	23,898	Saginaw, Mich.	42,345
Albany, N.Y.	94,151	Danbury, Conn.	16,537	Jeffersonville, Ind.	10,774	Nashville, Tenn.	80,865	St. Joseph, Mo.	102,979
Alexandria, Va.	14,528	Danville, Ill.	16,354	Jersey City, N.J.	206,433	Natchez, Miss.	12,210	St. Louis, Mo.	575,238
Allegheny, Pa.	129,896	Danville, Va.	16,520	Johnstown, N.Y.	10,130	Naugatuck, Conn.	10,541	St. Paul, Minn.	163,065
Allentown, Pa.	35,416	Davenport, Ia.	35,254	Johnstown, Pa.	35,936	New Albany, Ind.	20,628	Salem, Mass.	35,956
Alpena, Mich.	11,802	Dayton, O.	85,333	Joliet, Ill.	29,353	Newark, N.J.	246,070	Salt Lake City, Utah	53,531
Alton, Ill.	14,210	Decatur, Ill.	20,754	Joplin, Mo.	26,023	Newark, O.	18,157	San Antonio, Tex.	53,321
Altoona, Pa.	38,973	Denison, Tex.	11,807	**Kalamazoo,** Mich.	24,404	New Bedford, Mass.	62,442	San Diego, Cal.	17,700
Amsterdam, N.Y.	20,929	Denver, Col.	133,859	Kankakee, Ill.	13,595	New Britain, Conn.	25,998	Sandusky, O.	19,664
Anderson, Ind.	20,178	Des Moines, Ia.	62,139	Kansas City, Kan.	51,418	New Brunswick, N.J.	20,006	San Francisco, Cal.	342,782
Ann Arbor, Mich.	14,509	Detroit, Mich.	285,704	Kansas City, Mo.	163,752	Newburg, N.Y.	24,943	San Jose, Cal.	21,500
Ansonia, Conn.	12,681	Dover, N.H.	13,207	Kearney, N.J.	10,896	Newburyport, Mass.	14,478	San Juan, P.R.	32,048
Appleton, Wis.	15,085	Dubuque, Ia.	36,297	Kenosha, Wis.	11,606	Newcastle, Pa.	28,339	Saratoga Springs, N.Y.	12,409
Asheville, N.C.	14,694	Duluth, Minn.	52,969	Keokuk, Ia.	14,641	New Haven, Conn.	108,027	Sault Ste. Marie, Mich.	10,538
Ashland, Wis.	13,074	Dunkirk, N.Y.	11,616	Key West, Fla.	17,114	New London, Conn.	17,548	Savannah, Ga.	54,244
Ashtabula, O.	12,949	Dunmore, Pa.	12,583	Kingston, N.Y.	24,535	New Orleans, La.	287,104	Schenectady, N.Y.	31,682
Atchison, Kan.	15,722	**East Liverpool,** O.	16,485	Knoxville, Tenn.	32,637	Newport, Ky.	28,301	Scranton, Pa.	102,026
Athens, Ga.	10,245	Easton, Pa.	25,238	Kokomo, Ind.	10,609	Newport, R.I.	22,034	Seattle, Wash.	80,671
Atlanta, Ga.	89,872	East Orange, N.J.	21,506	**La Crosse,** Wis.	28,895	Newport News, Va.	19,635	Sedalia, Mo.	15,231
Atlantic City, N.J.	27,838	East Providence, R.I.	12,138	Lafayette, Ind.	18,116	New Rochelle, N.Y.	14,720	Shamokin, Pa.	18,202
Attleboro, Mass.	11,335	East St. Louis, Ill.	29,655	Lancaster, Pa.	41,459	Newton, Mass.	33,587	Sheboygan, Wis.	22,962
Auburn, Me.	12,951	Eau Claire, Wis.	17,517	Lansing, Mich.	16,485	New York, N.Y.	3,437,202	Shenandoah, Pa.	20,321
Auburn, N.Y.	30,345	Elgin, Ill.	22,433	Lansingburg, N.Y.	12,595	Niagara Falls, N.Y.	19,457	Sherman, Tex.	10,243
Augusta, Ga.	39,441	Elizabeth, N.J.	52,130	Laredo, Tex.	13,429	Nome, Alaska	12,486	Shreveport, La.	16,013
Augusta, Me.	11,683	Elkhart, Ind.	15,184	Lasalle, Ill.	10,446	Norfolk, Va.	46,624	Sioux City, Ia.	33,111
Aurora, Ill.	24,147	Elmira, N.Y.	35,672	Lawrence, Kan.	10,862	Norristown, Pa.	22,265	Sioux Falls, S.D.	10,266
Austin, Tex.	22,258	El Paso, Tex.	15,906	Lawrence, Mass.	62,559	North Adams, Mass.	24,200	Somerville, Mass.	61,643
Baltimore, Md.	508,957	Elwood, Ind.	12,950	Leadville, Col.	12,455	Northampton, Mass.	18,643	South Bend, Ind.	35,999
Bangor, Me.	21,850	Erie, Pa.	52,733	Leavenworth, Kan.	20,735	Norwich, Conn.	17,251	So. Bethlehem, Pa.	13,241
Bath, Me.	10,477	Evanston, Ill.	19,259	Lebanon, Pa.	17,628	**Oakland,** Cal.	66,960	Southbridge, Mass.	10,025
Baton Rouge, La.	11,269	Evansville, Ind.	59,007	Leominster, Mass.	12,392	Ogden, Utah	16,313	South Omaha, Neb.	26,001
Battle Creek, Mich.	18,563	Everett, Mass.	24,336	Lewiston, Me.	23,761	Ogdensburg, N.Y.	12,633	Spartanburg, S.C.	11,395
Bay City, Mich.	27,628	**Fall River,** Mass.	104,863	Lexington, Ky.	26,369	Oil City, Pa.	13,264	Spokane, Wash.	36,848
Bayonne, N.J.	32,722	Findlay, O.	17,613	Lima, O.	21,723	Oklahoma, Okla.	10,037	Springfield, Ill.	34,159
Beaver Falls, Pa.	10,054	Fitchburg, Mass.	31,531	Lincoln, Neb.	40,169	Omaha, Neb.	102,555	Springfield, Mass.	62,059
Belleville, Ill.	17,484	Flint, Mich.	13,103	Little Falls, N.Y.	10,381	Orange, N.J.	24,141	Springfield, Mo.	23,267
Beloit, Wis.	10,436	Fond du Lac, Wis.	15,110	Little Rock, Ark.	38,307	Oshkosh, Wis.	28,284	Springfield, O.	38,253
Berkeley, Cal.	13,214	Fort Dodge, Ia.	12,162	Lockport, N.Y.	16,581	Oswego, N.Y.	22,199	Stamford, Conn.	15,997
Beverly, Mass.	13,884	Fort Scott, Kan.	10,322	Logansport, Ind.	16,204	Ottawa, Ill.	10,588	Steelton, Pa.	12,086
Biddeford, Me.	16,145	Fort Smith, Ark.	11,587	Lorain, O.	16,028	Ottumwa, Ia.	18,197	Steubenville, O.	14,349
Binghamton, N.Y.	39,647	Fort Wayne, Ind.	45,115	Los Angeles, Cal.	102,479	Owensboro, Ky.	13,189	Stillwater, Minn.	12,318
Birmingham, Ala.	38,415	Fort Worth, Tex.	26,688	Louisville, Ky.	204,731	**Paducah,** Ky.	19,446	Stockton, Cal.	17,506
Bloomington, Ill.	23,286	Framingham, Mass.	11,302	Lowell, Mass.	94,969	Parkersburg, W. Va.	11,703	Streator, Ill.	14,079
Boston, Mass.	560,892	Freeport, Ill.	13,258	Lynchburg, Va.	18,891	Passaic, N.J.	27,777	Superior, Wis.	31,091
Braddock, Pa.	15,654	Fresno, Cal.	12,470	Lynn, Mass.	68,513	Paterson, N.J.	105,171	Syracuse, N.Y.	108,374
Bradford, Pa.	15,029	**Galena,** Kan.	10,155	**McKeesport,** Pa.	34,227	Pawtucket, R.I.	39,231	**Tacoma,** Wash.	37,714
Bridgeport, Conn.	70,996	Galesburg, Ill.	18,607	Macon, Ga.	23,272	Peabody, Mass.	11,523	Tampa, Fla.	15,839
Bridgeton, N.J.	13,913	Galveston, Tex.	37,789	Madison, Wis.	19,164	Peekskill, N.Y.	10,358	Taunton, Mass.	31,036
Brockton, Mass.	40,063	Gardner, Mass.	10,813	Mahanoy, Pa.	13,504	Pensacola, Fla.	17,747	Terre Haute, Ind.	36,673
Brookline, Mass.	19,935	Geneva, N.Y.	10,433	Malden, Mass.	33,664	Peoria, Ill.	56,100	Tiffin, O.	10,989
Buffalo, N.Y.	352,387	Georgetown, D.C.	14,549	Manchester, N.H.	56,987	Perth Amboy, N.J.	17,699	Toledo, O.	131,822
Burlington, Ia.	23,201	Glens Falls, N.Y.	12,613	Manila, P.I.	350,000	Petersburg, Va.	21,810	Topeka, Kan.	33,608
Burlington, Vt.	18,640	Gloucester, Mass.	26,121	Manistee, Mich.	14,260	Philadelphia, Pa.	1,293,697	Trenton, N.J.	73,307
Butler, Pa.	10,853	Gloversville, N.Y.	18,349	Manitowoc, Wis.	11,786	Phillipsburg, N.J.	10,052	Troy, N.Y.	60,651
Butte, Mont.	30,470	Grand Rapids, Mich.	87,565	Mankato, Minn.	10,599	Pine Bluff, Ark.	11,496	**Union,** N.J.	15,187
Cairo, Ill.	12,566	Great Falls, Mont.	14,930	Mansfield, O.	17,640	Piqua, O.	12,172	Utica, N.Y.	56,383
Cambridge, Mass.	91,886	Green Bay, Wis.	18,684	Marietta, O.	13,348	Pittsburg, Kan.	10,112	**Vicksburg,** Miss.	14,834
Camden, N.J.	75,935	Greensboro, N.C.	10,035	Marinette, Wis.	16,195	Pittsburg, Pa.	321,616	Vincennes, Ind.	10,249
Canton, O.	30,667	Greenville, S.C.	11,860	Marlboro, Mass.	13,609	Pittsfield, Mass.	21,766	**Waco,** Tex.	20,686
Carbondale, Pa.	13,536	Greenwich, Conn.	12,172	Marion, Ind.	17,337	Pittston, Pa.	12,556	Wallawalla, Wash.	10,049
Cedar Rapids, Ia.	25,656	Guthrie, Okla.	10,006	Marion, O.	11,862	Plainfield, N.J.	15,369	Waltham, Mass.	23,481
Central Falls, R.I.	18,167	**Hagerstown,** Md.	13,591	Marquette, Mich.	10,058	Plymouth, Pa.	13,649	Warwick, R.I.	21,316
Charleston, S.C.	55,807	Hamilton, O.	23,914	Marshalltown, Ia.	11,544	Ponce, P.R.	27,952	Washington, D.C.	278,718
Charleston, W.Va.	11,099	Hammond, Ind.	12,376	Massillon, O.	11,944	Port Huron, Mich.	19,158	Waterbury, Conn.	45,859
Charlotte, N.C.	18,091	Hannibal, Mo.	12,780	Mayaguez, P.R.	15,187	Portland, Me.	50,145	Waterloo, Ia.	12,580
Chattanooga, Tenn.	30,154	Harrisburg, Pa.	50,167	Meadville, Pa.	10,291	Portland, Ore.	90,426	Watertown, N.Y.	21,696
Chelsea, Mass.	34,072	Harrison, N.J.	10,596	Medford, Mass.	18,244	Portsmouth, N.H.	10,637	Watervliet, N.Y.	14,321
Chester, Pa.	33,988	Hartford, Conn.	79,850	Melrose, Mass.	12,962	Portsmouth, O.	17,870	Wausaw, Wis.	12,354
Cheyenne, Wy.	14,087	Haverhill, Mass.	37,175	Memphis, Tenn.	102,320	Portsmouth, Va.	17,427	West Bay City, Mich.	13,119
Chicago, Ill.	1,698,575	Hazleton, Pa.	14,230	Menominee, Mich.	12,818	Pottstown, Pa.	13,696	Westfield, Mass.	12,310
Chicopee, Mass.	19,167	Helena, Mont.	10,770	Meriden, Conn.	24,296	Pottsville, Pa.	15,710	West Hoboken, N.J.	23,094
Chillicothe, O.	12,976	Henderson, Ky.	10,272	Meridian, Miss.	14,050	Poughkeepsie, N.Y.	24,029	Weymouth, Mass.	11,324
Cincinnati, O.	325,902	Hoboken, N.J.	59,364	Michigan City, Ind.	14,850	Providence, R.I.	175,597	Wheeling, W. Va.	38,878
Cleveland, O.	381,768	Holyoke, Mass.	45,712	Middletown, N.Y.	14,522	Pueblo, Col.	28,157	Wichita, Kan.	24,671
Clinton, Ia.	22,698	Homestead, Pa.	12,554	Milford, Mass.	11,376	**Quincy,** Ill.	36,252	Wilkesbarre, Pa.	51,721
Clinton, Mass.	13,667	Honolulu, Hawaii	39,306	Millville, N.J.	10,583	Quincy, Mass.	23,899	Wilkinsburg, Pa.	11,886
Cohoes, N.Y.	23,910	Hornellsville, N.Y.	11,918	Milwaukee, Wis.	285,315	Racine, Wis.	29,102	Williamsport, Pa.	28,757
Colorado Sp'gs, Col.	21,085	Houston, Tex.	44,633	Minneapolis, Minn.	202,718	Raleigh, N.C.	13,643	Wilmington, Del.	76,508
Columbia, Pa.	12,316	Huntington, W. Va.	11,923	Mobile, Ala.	38,469	Reading, Pa.	78,961	Wilmington, N.C.	20,976
Columbia, S.C.	21,108	Hyde Park, Mass.	13,244	Moline, Ill.	17,248	Revere, Mass.	10,395	Winona, Minn.	19,714
Columbus, Ga.	17,614	**Indianapolis,** Ind.	169,164	Montclair, N.J.	13,962	Richmond, Ind.	18,226	Winston, N.C.	10,008
Columbus, O.	125,560	Ironton, O.	11,868	Montgomery, Ala.	30,346	Richmond, Va.	85,050	Woburn, Mass.	14,254
Concord, N.H.	19,632	Ishpeming, Mich.	13,255	Morristown, N.J.	11,267	Roanoke, Va.	21,495	Woonsocket, R.I.	28,204
Corning, N.Y.	11,061	Ithaca, N.Y.	13,136	Mt. Carmel, Pa.	13,179	Rochester, N.Y.	162,608	Worcester, Mass.	118,421
Council Bluffs, Ia.	25,802	**Jackson,** Mich.	25,180	Mt. Vernon, N.Y.	21,228	Rockford, Ill.	31,051	**Yonkers,** N.Y.	47,931
Covington, Ky.	42,938	Jackson, Tenn.	14,511	Muncie, Ind.	20,942	Rock Island, Ill.	19,493	York, Pa.	33,708
Cranston, R.I.	13,343	Jacksonville, Fla.	28,429	Muscatine, Ia.	14,073	Rome, N.Y.	15,343	Youngstown, O.	44,885
								Zanesville, O.	23,538

PRONOUNCING VOCABULARY

Aachen, ä′kẹn.
Abaco, ă′bä-kō.
Aberdeen, ăb-ẹr-dēn′.
Abomey, ăb-ō-mā′.
Abyssinia, ăb-ĭs-sĭn′ĭ-ạ.
Acapulco, ä-kä-po͞ol′kō.
Acaray, ä-kär′ā.
Aconcagua, ä-kŏn-kä′gwä.
Acropolis, ă-krŏp′ō-lĭs.
Adelaide, ăd′ẹ-lād.
Aden, ä′dẹn.
Adige, ăd′ĭ-jē.
Adirondack, ăd-ị-rŏn′dạk.
Adrian, ā′drĭ-ạn.
Adrianople, ăd-rĭ-ạn-ō′pl.
Adriatic, ād-rē-ăt′ĭk.
Ægean, ē-jē′ạn.
Afghanistan, ăf-găn-ĭs-tän′.
Africa, ăf′rĭ-kạ.
Agana, ä-gän′yä.
Aguadilla, ä-gwä-dē′yä.
Ajaccio, ä-yät′chō.
Akron, ăk′rọn.
Alabama, ăl-ạ-bă′mạ.
Alameda, ä-lä-mā′dạ.
Alamo, ă′lä-mō.
Alaska, ä-lăs′kạ.
Albany, ạl′bạ-nĭ.
Albay, äl-bī′.
Albemarle, ăl′bẹ-märl.
Alberta, ăl-bĕrt′ạ.
Albuquerque, äl-bo͞o-kār′kẽ.
Alderney, ạl′dẹr-nĭ.
Aleppo, ä-lĕp′ō.
Aleutian, ä-lū′shĭ-ạn.
Alexandria, ăl-ẹgs-ăn′drĭ-ạ.
Algeria, ăl-jē′rĭ-ä.
Algiers, ăl-jērz′.
Alhambra, ăl-hăm′brạ.
Allegheny, ăl′ẹ-gā-nĭ.
Alpena, ăl-pē′nạ.
Altai, äl-tī′.
Altamaha, ạl-tạ-mạ-hạ′.
Altoona, ăl-to͞o′nạ.
Amadeus, ăm-ạ-dē′ŭs.
Amazon, ăm′ạ-zŏn.
Ameer, ä-mēr′.
Amiens, ä′mĭ-ăɴ.
Amsterdam, ăm′stẹr-dăm.
Amur, ä-mo͞or′.
Anam, ä-năm′.
Andes, ăn′dēz.
Andorra, än-dōr′rä.
Androscoggin, ăn-drọs-cŏg′ĭn.
Angers, ŏɴ-zhā′.
Anglesey, ăn′gl-sē.
Annapolis, ăn-năp′ō-lĭs.
Anniston, ăn′ĭs-tọn.
Antarctic, ăn-tärk′tĭk.
Anticosti, ăn-tĭ-kŏs′tĭ.
Antigua, ăn-tē′gạ.
Antilles, ăn-tĭl′lēz *or* ŏɴ-tēl′.
Antofagasta, ăn-tō-fä-gäs′tä.
Antwerp, ănt′wẹrp.
Apache, ä-pä′chä.
Apalachee, ăp-ạ-lăch′ē.
Apalachicola, ä-pạ-lăch-ĭ-kō′lä.
Apari, ä-pä-rē′.
Apennines, ăp′ẹn-nīnz.
Apia, ä′pē-ä.
Appalachian, ăp-pạ-lā′chĭ-ạn.
Appomattox, ăp-pō-măt′tọks.
Arabia, ă-rā′bĭ-ạ.
Arabic, ăr′ă-bĭk.
Aral, ăr′ạl.
Ararat, ăr′ạ-răt.
Archangel, ärk-ān′jĕl.
Archipelago, är-kĭ-pĕl′ă-gō.
Arctic, ärk′tĭk.
Ardennes, är-dĕn′.
Arecibo, ä-rā-sē′bō.
Arequipa, ä-rā-kē′pä.
Argentina, är-jĕn-tē′nạ.
Arica, ä-rē′kä.
Arizona, ăr-ĭ-zō′nạ.
Arkansas, är′kạn-sạ.
Arnhem, ärn′hĕm.
Arno, är′nō.
Aryan, ăr′yạn.
Asben, äs-bĕn′.
Asheville, ăsh′vĭl.
Asia, ā′shĭ-ạ.
Asiatic, ā-shĭ-ăt′ĭk.
Assiniboia, ăs-sĭn-ĭ-boi′ạ.
Assiniboine, ăs-sĭn′ĭ-boin.
Assouan, äs-swän′.
Astoria, ăs-tō′rĭ-ạ.
Astrakhan, äs-trä-kän′.
Asuncion, ä-so͞on-sē-ōn′.
Atacama, ä-tä-kä′mä.
Atbara, ät-bä′rä.
Atchafalaya, ăch-ạf-ạ-lī′ạ.
Atchison, ăch′ĭ-sọn.
Athabasca, ăth-ạ-băs′kạ.
Athens, ăth′ẽnz.
Atlanta, ăt-lăn′tạ.
Atlantic, ăt-lăn′tĭk.
Atoll, ă-tŏl′.
Auburn, ạ′bûrn.
Auckland, ạk′lạnd.
Augusta, ạ-gŭs′tạ.
Aurora, ạ-rō′rạ.
Au Sable, ạ sā′bl.
Austin, ạs′tĭn.
Australia, ạs-trā′lĭ-ạ.
Australis, ạs-trā′lis.
Austria, ạs′trĭ-ạ.
Avon, ā′vọn.
Azof, ä-zŏf′.
Azores, ạ-zōrz′.

Bagdad, băg-dăd′.
Bahama, bạ-hā′mạ.
Bahia, bä-ē′ä.
Baikal, bī′käl.
Baku, bä-ko͞o′.
Balabac, bä-lä-bäc′.
Balanga, bä-läng′gä.
Balearic, băl-ẹ-ăr′ĭk.
Bali, bä′lē.
Balkan, bäl-kän′.
Balkash, bäl-käsh′.
Ballarat, băl-lạ-răt′.
Baltic, bạl′tĭk.
Baltimore, bạl′tĭ-mọr *or* -mōr.
Baluchistan, bä-lo͞o-chĭs-tän′.
Banca, băn′kạ.
Bangkok, băn-kŏk′.
Bangor, băn′gôr.
Bantry, băn′trĭ.
Baracoa, bä-rä-cō′ä.
Barbados, bär′bạ-dōs.
Barcelona, bär-sẹ-lō′nä.
Basel, bä′zẹl.
Basque, bäsk.
Batabano, bä-tä-bä-nō′.
Batangas, bä-tän′gäs.
Batavia, bä-tā′vĭ-ä.
Baton Rouge, băt-ŭn ro͞ozh′.
Batum, bä-to͞om′.
Bay, bī (Luzon).
Bayamon, bä-yä-mōn′.
Bayonne, bā-yŏn′.
Bayou, bī′o͞o.
Beatrice, bē′ạ-trēs.
Beaufort, bō′fŏrt (N. C.) *or* bū′fûrt (S. C.).
Bechuanaland, bĕk-ū-ăn′ạ-lănd.
Belfast, bĕl′făst (Me.) *or* bĕl-făst′ (Ireland).
Belgium, bĕl′jĭ-ŭm.
Belgrade, bĕl-grād′.
Belize, bā-lēz′.
Bellaire, bĕl-âr′.
Belle Isle, bĕl ĭl′.
Benares, bĕn-ä′rĕz.
Bengal, bĕn-gạl′.
Benguela, bĕn-gā′lä.
Ben-Lomond, bĕn-lŏ′mọnd.
Ben-Nevis, bĕn-nĕv′ĭs.
Berber, bĕr′bẹr.
Berea, bĕr′ē-ạ.
Bergen, bĕr′gĕn.
Bergwerk, bĕrg′vĕrk.
Bering, bē′rĭng.
Berlin, bĕr′lĭn *or Ger.* bĕr-lēn′.
Bermuda, bẹr-mū′dạ.
Bern, bĕrn.
Bethlehem, bĕth′lẹ-hĕm.
Bhutan, bo͞o-tän′.
Biddeford, bĭd′ẹ-fọrd.
Billiton, bĭl-lị-tŏn′.
Binghamton, bĭng′ạm-tọn.
Binue, bĭn-o͞o-ē′.
Birkenhead, bĕrk′ẹn-hĕd.
Birmingham, bĕr′mĭng-ŭm.
Biscay, bĭs′kā.
Bismarck, bĭs′märk.
Bissao, bĭs-sowɴ′.
Bloemfontein, blĕm-fŏn′tĭn.
Boer, bō͞or.
Bogota, bō-gō-tä′.
Bohmerwald, bē′mẹr-vält.
Bohol, bō-ōl′.
Boise, boi-zā′.
Bokhara, bŏk-ä′rä.
Bolan, bō′lạn.
Bolivar, bō-lē′vär.
Bolivia, bọ-lĭv′ĭ-ạ.
Bologna, bō-lōn′yä.
Boma, bō′mä.
Bombay, bŏm-bā′.
Boothia, bo͞o′thĭ-ạ.
Bordeaux, bôr-dō′.
Borneo, bôr′nē-ō.
Bosna-Serai, bŏs-nä-sĕr-ĭ′.
Bosnia, bŏz′nĭ-ä.
Bosphorus, bŏs′fō-rŭs.
Bothnia, bŏth′nĭ-ạ.
Boyne, boin.
Bradford, brăd′fọrd.
Brahma, brä′mạ.
Brahmaputra, brä-mạ-po͞o′trạ.
Brazil, brạ-zĭl′.
Brazos, brä′sọs.
Bremen, brā′mĕn.
Breslau, brĕs′low.
Brest, brĕst.
Brindisi, brēn′dē-sē.
Brisbane, brĭs′bān.
Brooklyn, brook′lĭn.
Brule, brū′lā.
Brunswick, brŭnz′wĭk.
Brussels, brŭs′sẹlz.
Budapest, bo͞o′dạ-pĕst.
Buddha, bo͞o′dạ.
Buenos Aires, bwā′nōs ī′rĕs.
Bukharest, bū′kạ-rĕst′.
Bulacan, bo͞o-lä-kän′.
Bulgaria, bo͞ol-gā′rĭ-ạ.
Burlington, bûr′lĭng-tọn.
Burma, bûr′mä.
Butte, būt.

Cadillac, kăd-ĭl-lăk′.
Cagliari, käl′yä-rē.
Caimanera, kī-mä-nā′rä.
Cairo, kā′rō (U.S.); kī′rō (Egypt).
Calais, kăl′ĭs (U. S.); kä-lā′ (France).
Calcutta, kăl-kŭt′tạ.
Caledonia, kăl-ẹ-dō′nĭ-ạ.
California, kăl-ĭ-fôr′nĭ-ạ.
Callao, kä-yä′ō.
Cambodia, kăm-bō′dẹ-ạ.
Cambrian, kăm′brĭ-ạn.
Cambridge, kām′brĭj.
Campêche, käm-pā′chā.
Campos, käm′pōs.
Canada, kăn′ạ-dạ.
Canadian, kạ-nā′dẹ-ạn.
Candia, kăn′dẹ-ä.
Cantabrian, kăn-tā′brị-ạn.
Canton, kăn′tọn (U.S.); kăn-tŏn′ (China).
Cape Breton, brĕt′ọn.
Carabao, kä-rä-bä′ō.
Caracas, kä-rä′käs.
Cardenas, kär′dā-näs.
Cardiff, kär′dĭf.
Cardigan, kär′dĕ-gạn.
Caribbean, kăr-ĭb-bē′ạn.
Carolina, kăr-ō-lī′nạ.
Carpentaria, kär-pĕn-tā′rẹ-ạ.
Cartagena, kär-tạ-jē′nạ.
Caspian, kăs′pĭ-ạn.
Cassava, kăs′sạ-vạ.
Cassiquiari, kä-sē-kē-ä′rē.
Catanduanes, kä-tän-do͞o-än′ĕs.
Catoche, kä-tō′shä.
Caucasian, kạ-kā′shạn.
Caucasus, kạ′kạ-sŭs.
Cavite, kä-vē′tā.
Cayenne, kā-yĕn′.
Cayuga, kā-yo͞o′gạ.
Cebu, sē-bo͞o′.
Celebes, sĕl-ē′bĕz.
Cenis, sẹ-nē′.
Cetinje, chā-tēn′yā.
Cevennes, sā-vĕnn′.
Ceylon, sē-lŏn′.
Chalon, shä-lōɴ′.
Chamouni, shä-mo͞o-nē′.
Champlain, shăm-plān′.
Chandeleur, shăn-dẹ-lo͞or′.
Chapala, shä-pä′lä.
Charlotte, shär′lọt.
Charlotte Amalie, -ä-mä′lē-ạ.
Chatham, chăt′ạm.
Chattahoochee, chăt-tạ-ho͞o′chē.
Chattanooga, chăt-tă-nō͞o′gạ.
Chautauqua, chạ-tạ′kwạ.
Chelan, chē-lăn′.
Chelsea, chĕl′sē.
Chemnitz, kĕm′nĭts.
Cherbourg, shĕr′bûrg.
Cherokee, chĕr-ō-kē′.
Cherrapunji, chĕr-ä-po͞on-jē′.
Chesapeake, chĕs′ạ-pēk.
Cheviot, chĭv′ẹ-ŭt.
Cheyenne, shī-ĕn′.
Chicago, shẹ-kạ′gō.
Chickasaw, chĭk′ạ-sạ.
Chihuahua, chē-wä′wä.
Chile, chē′lā.
Chillicothe, chĭl-lĭ-kŏth′ẹ.
Chimborazo, chĭm-bō-rä′zō.
Chippewa, chĭp′pẹ-wä.
Choctaw, chŏk′tạ.
Christiania, krĭs-tē-ä′nē-ä.
Christiansted, krĭs′tē-ăn-stĕd.
Cienfuegos, sē-ĕn-fwā′gōs.
Cincinnati, sĭn-sĭn-nă′tĭ.
Clyde, klīd.
Cochin China, kō′chĭn chī′nạ.
Cœur d'Alene, kûr dä-lăn′.
Cohoes, kō-hōz′.
Colima, kō-lē′mä.
Cologne, kō-lōn′.
Colombia, kō-lŏm′bē-ä.
Colombo, kō-lōm′bō.
Colon, kō-lŏn′.
Colorado, kŏl-ọ-rä′dō.
Como, kō′mō.
Conception, kọn-sĕp′shŭn.
Connecticut, kŏn-nĕt′ĭ-kŭt.
Constance, kŏn′stạns.
Constantinople, kŏn-stăn-tĭ-nō′pl.
Coosa, ko͞o′sạ.
Copenhagen, kō-pẹn-hā′gẹn.
Cordoba, kôr′dō-bä.
Corfu, kôr-fo͞o′.
Corinth, kŏr′ĭnth.
Corpus Christi, kôr′pŭs krĭs′tē.
Corrientes, kŏr-rē-ĕn′tĕs.
Corsica, kôr′sĭ-kạ.
Costa Rica, kŏs′tä rē′kä.
Cotopaxi, kō-tō-păk′sē.
Covington, kŭv′ĭng-tọn.
Crimea, krī-mē′ạ.
Culebra, ko͞o-lā′brä.
Culloden, kŭl-lō′dẹn.
Cumbrian, kŭm′brĭ-ạn.
Curaçao, kū-rạ-sō′.
Cuzco, ko͞os′kc̆.
Cyprus, sī′prŭs.

Dahomey, dä-hō′mā.
Dakota, dạ-kō′tạ.
Dallas, dăl′ạs.
Damascus, dạ-măs′kŭs.
Danube, dăn′ūb.
Danzig, dänt′zĭk.
Dardanelles, där-dạ-nĕlz′.
Darfur, där′fo͞or.
Darien, dā′rẹ-ĕn.
Davenport, dăv′ẹn-pōrt.
Decatur, dē-kā′tụr.
Dekkan, dĕk′kạn.
Delaware, dĕl′ạ-wâr.
Delhi, India, dĕl′lē.
Des Moines, dā moin′.
Des Plaines, dā plān′.
Detroit, dẹ-troit′.
Dijon, dē-zhōɴ′.
Dnieper, nē′pẹr.
Dniester, nēs′tẹr.
Dominica, dŏm-ẹ-nē′kạ.
Donegal, dŏn-ẹ-gạl′.
Dovrefield, dō-vrẹ-fyĕld′.
Drave, dräv.
Dresden, drĕz′dẹn.
Drogheda, drŏ′hẹ-dạ.
Dublin, dŭb′lĭn.
Dubuque, do͞o-būk′.
Duluth, dū-lo͞oth′.
Duncansby, dŭn′kạns-bĭ.
Dundalk, dŭn-dạk′.
Dundee, dŭn-dē′.
Dunedin, dŭn-ĕd′ĭn.
Dungeness, dŭn-jẹ-nĕs′.
Durango, do͞o-răn′gō.
Dwina, dwē′nạ.
Dyaks, dī′ăks.

Eau Claire, ō klâr′.
Ebro, ē′brō.
Ecuador, ĕk-wä-dōr′.
Edinburgh, ĕd′ịn-bŭr-ō.
Egypt, ē′jĭpt.
Egyptian, ē-jĭp′shạn.
Elba, ĕl′bä.
Elbe, ĕl′bẹ.
Elberfeld, ĕl′bẹr-fĕlt.
Elburz, ĕl-bo͞orz′.
Eleuthera, ẹ-lū′thẹr-ä.
Elgin, ĕl′jĭn.
Elmira, ĕl-mī′rạ.
El Paso, ĕl pă′sō.
Elyria, ē-lĭr′ẹ-ạ.
Erz, ĕrts.
Essen, ĕs′sẹn.
Essequibo, ĕs-sā-kē′bō.
Etna, ĕt′nạ.
Eubœa, ū-bē′ạ.
Euphrates, ū-frā′tēz.
Eurasia, ū-rā′shĭ-ạ.
European, ū-rō-pē′ạn.
Evansville, ĕv′ạnz-vĭl.
Everest, ĕv′ẹr-ĕst.
Eyre, âr.

Falkland, fạk′lạnd.
Faribault, fâr-ẹ-bō′.
Fez, fĕz.
Fezzan, fĕz-zän′.
Fiji, fē′jē.
Filipino, fĭl-ĭ-pē′nō.
Findlay, fĭnd′lā.
Finland, fĭn′lạnd.
Fiord, fyôrd.
Firth, fẽrth.
Flamborough, flăm′bŭr-rō.
Florida, flŏr′ĭ-dạ.
Fond du Lac, fŏn dū lăk′.
Formosa, fôr-mō′sä.
Fort Wayne, -wān.
Frankfurt, frăɴk′fo͞ort.
Fraser, frā′zẹr.
Frederichsted, frĕd′ẽr-ĭk-stĕd.
Fremont, frē-mŏnt′.
Fresno, frĕs′nō.
Fuchau, fo͞o′chow.
Fuegian, fū-ē′jĭ ạn.
Fujiyama, fo͞o-jĭ-ä′mä.

Galapagos, gă-lăp′ă-gōs.
Galatz, gä′läts.
Galilee, găl′ĭ-lē.
Galveston, găl′vẹs-ton.
Galway, gạl′wā.
Ganges, găn′jēz.
Garda, gär′dä.
Garonne, gä-rŏn′.
Gasconade, găs-kō-nād′.
Genesee, jĕn-ẹ-sē′.
Geneva, jẹ-nē′vạ.
Genoa, jĕn′ọ-ạ.
Georgia, jôr′jĭ-ạ.

Geral, hā-räl′.
Gettysburg, gĕt′ĭz-bûrg.
Geyser, gī′sẽr.
Ghats, gäts.
Ghent, gĕnt.
Gibraltar, jĭ-brạl′tạr.
Gila, hē′lä.
Girardeau, jē-rär-dō′.
Gironde, zhē-rōnd′.
Glasgow, glăs′gō.
Gloucester, glŏs′tẹr.
Gloversville, glŭv′ẹrz-vĭl.
Gobi, gō′bē.
Gondar, gŏn′där.
Gottenborg, gōt′ĕn-bôrg.
Grampian, grăm′pĭ-ạn.
Granada, grä-nä′dä.
Gran Chaco, grän chä′kō.
Grand Manan, -mạ-năn′.
Gratz, grĕts.
Greenwich, grĕn′wĭch (U. S.); grĕn′ĭj (Eng.).
Grinnell, grĭn-ĕl′.
Guadalajara, gwä-dä-lä-hä′rä.
Guadalquivir, gwä-däl-kē-vẽr′.
Guadalupe, gạ-dạ-lo͞op′ (U. S.); gwä-dä-lo͞o′pā (Spanish).
Guam, gwäm.
Guanabacoa, gwä-nä-bä-kō′ä.
Guanajuato, gwä-nä-hwä′tō.
Guantanamo, gwän-tä′nä-mō.
Guatemala, gwạ-tä-mä′lä.
Guayama, gwī-ä′mä.
Guayaquil, gwī-ä-kēl′.
Guernsey, gẽrn′zẹ.
Guiana, gē-ä′nä.
Guinea, gĭn′ẽ.
Guthrie, gŭth′rẹ.
Guyandot, gī-ạn-dŏt′.

Hagerstown, hā′gẹrz-town.
Hague, hāg.
Hainan, hī-nän′.
Haiti, hā′tĭ.
Hakodate, hä-kō-dä′tē.
Halifax, hăl′ẹ-făks.
Halle, häl′lẹ.
Hamburg, hăm′bûrg.
Hamite, hā′mīt.
Hankou, hän-kow′.
Hanoi, hä-nō′ē.
Hanover, hăn′ō-vẹr.
Hatteras, hăt′tẹr-ạs.
Havana, hạ-văn′ạ.
Havre, hä′vr.
Havre de Grace, -dẹ gräs.
Hawaii, hä-wī′ē.
Hebrides, hĕb′rĭ-dēz.
Hekla, hĕk′lạ.
Helena, hĕl′ẹ-nạ.
Helgoland, hĕl′gō-länd.
Henlopen, hĕn-lō′pẹn.
Herat, hẹr-ät′.
Herculaneum, hẽr-kū-lā′nẹ-ŭm.
Hiderabad, hī-dẽr-ạ-bäd′.
Hilo, ē′lō.
Himalaya, hĭm-ä′lạ-yạ.
Hindu Kush, hĭn′do͞o ko͞osh.
Hindustan, hĭn-do͞o-stän′.
Hoangho, hō-äng-hō′.
Hobart, hō′bạrt.
Hoboken, hō′bō-kẹn.
Holguin, ōl-gēn′.
Holyoke, hōl′yōk.
Hondo, hŏn′dō.
Honduras, hŏn-do͞o′rạs.
Hongkong, hŏng-kŏng′.
Honolulu, hō-nō-lo͞o′lo͞o.
Hoosac, ho͞o′sạk.
Housatonic, ho͞o-sạ-tŏn′ĭc.
Houston, hūs′tọn.
Hudson, hŭd′sọn.
Hue, ho͞o-ā′.
Hugli, ho͞o′glē.
Humber, hŭm′bẹr.
Humboldt, hŭm′bōlt.
Hungary, hŭn′gạ-rĭ.
Huron, hū′rọn.

Iberian, ī-bē′rẹ-ạn.
Idaho, ī′dạ-hō.
Illimani, ēl-yē-mä′nē.
Illinois, ĭl-lĭ-noi′ *or* -noiz′.
Iloilo, ē-lō-ē′lō.
Inagua, ē-nä′gwä.
Incas, ĭn′kạs.
India, ĭn′dĭ-ạ.
Indiana, ĭn-dĭ-ăn′ạ.
Indianapolis, ĭn-dĭ-ăn-ăp′ọ-lĭs.
Indies, ĭn′dēz.
Indus, ĭn′dŭs.
Innsbruck, ĭns′bro͝ok.
Inverness, ĭn-vẹr-nĕss′.
Ionian, ī-ō′nĭ-ạn.
Iowa, ī′ō-wạ.
Iquique, ē-kē′kā.
Iran, ē-rän′.
Irawadi, ē-rä-wä′dĭ.
Irkutsk, ĭr-ko͞otsk′.
Ironton, ī′ụrn-tọn.
Isla de Pinos, ēs′lä dā pē′nōs.
Isla de Vieques, -vyā′kās.
Ispahan, ĭs-pä-hän′.
Ishpeming, ĭsh′pẹm-ĭng.
Isle Royal, ēl rwä-yäl.
Italian, ĭ-tăl′yạn.
Itasca, ĭ-tăs′kạ.
Ithaca, ĭth′ạ-kạ.

Jalapa, hä-lä′pä.
Jamaica, jạ-mā′kạ.
Japan, jạ-păn′.
Jassy, yä′sē.
Java, jä′vạ.
Jersey, jẽr′zĭ.
Jerusalem, jẹ-ro͞o′sạ-lẽm.
Johannesburg, yō-hä′nĕs-bûrg.
Joliet, jō′lẹ-ĕt.
Jolo, ho-lō′.
Joplin, jŏp′lĭn.
Juan de Fuca, ho͞o-än′ dā fo͞okä.
Juan Fernandez, -fẽr-nän′dĕs.
Juarez, hwä′rĕs.
Jucaro, ho͞o′kä-rō.
Juneau, jū-nō′.
Jungfrau, yo͝ong′frow.
Juniata, jū-nĭ-ăt′ạ.
Jura, jū′rä.

Kabul, kä′bo͞ol.
Kadiak, käd-yăk .
Kaffir, kăf′fẽr.
Kahoolawe, kä-hō-ō-lä′vä.
Kalahari, kä-lä-hä′rĭ.
Kama, kä′mä.
Kamchatka, käm-chät′kạ.
Kamerun, kä-mā-ro͞on′.
Kanawha, kạ-nạ′wạ.
Kankakee, kăn-kạ-kē′.
Kano, kä-nō′.
Kara, kä′rä.
Karakoram, kä-rä-kō′răm.
Karpathian, kär-pā′thĭ-ạn.
Kashgar, käsh-gär′.
Kashmir, kăsh-mẽr′.
Kaskaskia, kăs-kăs′kĭ-ạ.
Katahdin, kạ-tä′dịn.
Katoomba, kä-to͞om′bạ.
Kauai, kow-ī′ē.
Kecskemet, kĕch-kĕm-ät′.
Kenia, kā-nē′ä.
Kennebec, kĕn-ẹ-bĕk′.
Kentucky, kĕn-tŭk′ĭ.
Keokuk, kē′ō-kŭk.
Khaibar, kä′ē-bär.
Khartum, kär-to͞om′.
Khelat, kẹl-ät′.
Khinghan, kĭn-gän′.
Khiva, kē′vä.
Kiakhta, kē-äk′tä.
Kiauchau, kē-ow′chow.
Kilauea, kē-low-ā′ä.
Kilimanjaro, kĭl-ē-män-jä-rō′.
Killarney, kĭl-är′nĭ.
Kimberley, kĭm′bẽr-lị.
Kiolen, kyē′lĕn.
Kirghiz, kĭr-gēz′.
Kirin, kĭr′ĭn.
Kirkcaldy, kịr-kạl′dĭ.
Kittery, kĭt′ẹr-ĭ.
Klamath, klă′măth.
Klondike, klŏn′dīk.
Knoxville, nŏks′vĭl.
Kobe, kō′bẹ.
Kongo, kŏn′gō.
Konigsberg, kō′nĭgs-bẽrg.
Kordofan, kôr-dō-fän′.
Korea, kō-rē′ạ.
Krakow, krā′kō.
Kremlin, krĕm′lĭn.
Kronstadt, krōn′stät.
Kuenlun, kwĕn-lo͞on′.
Kuka, ko͞o′ka.
Kyoto, kē-ō′tō.

Labrador, lăb-rạ-dôr′.
Lachine, lä-shēn′.
La Crosse, lạ krôs′.
Ladoga, lăd′ō-gạ.
Ladrones, lạ-drōn′ĕs.
Lafayette, lä-fā-ĕt′.
La Guaira, lä gwī′rä.
Laguna, lä-go͞o′nä.
Lamoille, lạ-moil′.
Lanai, lä-nä′ē.
Lancaster, lăn̲k′ạs-tẹr.
Landes, lōnd.
Lansing, lăn′sĭng.
Laoag, low-äg′.
La Paz, lä päs′.
Lapland, lăp′lạnd.
Laporte, lạ-pōrt′.
Laramie, lăr′ạ-mē.
Laredo, lạ-rā′dō.
Lasalle, lạ-săl′.
Lassa, läs′sä.
Lassen, lăs′sẹn.
Las Vegas, läs vā′gäs.
Laurentian, lạ-rĕn′shẹ-ạn.
Lausanne, lō-zän′.
Lead City, lēd.
Leadville, lĕd′vĭl.
Leavenworth, lĕv′ẹn-wọrth.
Lebanon, lēb′ạ-nọn.
Leghorn, lĕg′hôrn.
Leicester, lĕs′tẹr.
Leiden, lī′dẹn.
Leipzig, līp′zĭk.
Leith, lēth.
Lemberg, lĕm′bĕrg.
Leon, lā-ōn′ (Spanish).
Leone, lē-ō′nē.
Lexington, lĕk′sĭng-tọn.
Leyte, lā′ē-tā.
Liberia, lī-bē′rĭ-ạ.
Libyan, lĭb′ẹ-ạn.
Liege, lē-āzh′.
Lima, lī′mạ (U. S.); lē′mä (Peru).
Limerick, lĭm′er-ĭk.
Limoges, lē-mōzh′.
Lingayen, lēn-gä-yän′.
Lipari, lĭp′ạ-rē.
Lisbon, lĭz′bọn.
Lisburn, lĭs′bûrn.
Lisle, lēl.
Liverpool, lĭv′ẹr-po͞ol.
Llano Estacado, yä′nō ĕs-tä-kä′dō.
Loanda, lō-än′dä.
Loch, lŏk.
Lodz, lōdz.
Loess, lēs.
Lofoden, lō-fō′dẹn.
Logan, lō′gạn.
Loire, lwär.
Lombok, lŏm-bŏk′.
Londonderry, lŭn′dŭn-dĕr-ĭ.
Los Angeles, lōs ăn̲′gĕl-ĕs.
Lough Neagh, lŏh nā′.
Louisiana, lo͞o-ē-zē-ä′nạ.
Louisville, lo͞o′ĭs- *or* lo͞o′ĭ-vĭl.
Louvre, lo͞ovr.
Lucerne, lo͞o-sẽrn′.
Lucknow, lŭk′now.
Luray, lū-rā′.
Luxemburg, lo͞oks′ĕm-bûrg.
Luzon, lo͞o-sōn′.
Lyon, lē-ôn′.

Macao, mä-kow′.
Mackenzie, mạ-kĕn′zĭ.
Mackinac, măk′ĭ-nạ.
Macon, mā′kụn.
Madagascar, măd-ạ-găs′kạr.
Madeira, mạ-dē′rạ.
Madras, mạ-drăs′.
Madrid, măd′rĭd (U. S.); mạ drĭd′ (Spain).
Maestra, mä-äs′trä.
Magdalena, măg-dä-lā′nä.
Magdeburg, măg′dẹ-bo͞org.
Magellan, mạ-jĕl′ạn.
Maggiore, mäd-jō′rẹ.
Makassar, mạ-käs′sạr.
Malaga, mäl′ạ-gạ.
Malakka, mạ-lăk′ạ.
Malay, mạ-lā′.
Malaysia, mạ-lā′shĭ-ạ.
Malolos, mä-lō′lōs.
Managua, mä-nä′gwä.
Manchester, măn′chẹs-tẹr.
Manchuria, măn-cho͞o′rẹ-ạ.
Mandalay, măn′dạ-lā.
Manila, mạ-nĭl′ạ.
Manistee, mạn-ĭs-tē′.
Manitoba, măn-ĭ-tō′bä.
Manitou, măn′ẹ-to͞o.
Manitoulin, măn-ẹ-to͞o′lĭn.
Manzanillo, män-sä-nē′yō.
Maori, mä′ō-rē.
Maracaibo, mä-rä-kī′bō.
Maranon, mä-rän′yōn.
Marathon, măr′ạ-thŏn.
Marcy, mär′sĭ.
Marias, mạ-rī′ạz.
Marmora, mär′mọ-rạ.
Marseille, mär-sā′.
Martinique, mär-tĭ-nēk′.
Masbate, mäs-bä′tä.
Mashonaland, mạ-shō′nạ-lănd.
Maskat, măs-kăt′.
Massachusetts, măs-ạ-chū′sẹts.
Massaua, mäs-sow′ä.
Massillon, măs′ĭl-ọn.
Matabeleland, măt-ạ-bē′lănd.
Matagorda, măt-ạ-gôr′dạ.
Matamoros, măt-ạ-mō′rọs.
Matanzas, mạ-tăn′sạs.
Matapan, mä-tä-pän′ (Gr.).
Mauch Chunk, mạk chŭn̲k′.
Maui, mow′ē.
Maulmain, mạl-mīn′.
Mauna Kea, mow′nä kā′ä.
Mauna Loa, -lōä′.
Mauritius, mạ-rĭsh′ĭ-ŭs.
Mayaguez, mī-ä-gwās′.
Maysi, mĭ′sē.
Mazatlan, mä-sät-län′.
Mediterranean, mĕd-ĭ-tẹr-rā′nẹ-ạn.
Mekka, mĕk′ạ.
Mekong, mā-kŏng′.
Melanesia, mĕl-ạn-ē′shĭ-ạ.
Melbourne, mĕl′bûrn.
Memphis, mĕm′fĭs.
Menai, mĕn′ĭ.
Mendocino, mĕn-dō-sē′nō.
Menomonee, mẹ-nŏm′ọ-nē.
Meriden, mĕr′ĭ-dĕn.
Merrimac, mĕr′ĭ-măk.
Mersey, mẽr′zĭ.
Merthyr-Tydfil, mẽr-thẹr-tĭd′fĭl.
Messina, mĕs-sē′nä.
Metz, mĕts.
Mexico, mĕks′ĭ-kō.
Miami, mī-ăm′ĭ.
Michigan, mĭsh′ĭ-gạn.
Micronesia, mī-krō-nē′shĭ-ạ.
Milan, mĭl′ạn *or* mĭ-lăn′.
Mille Lacs, mēl läk′.
Milo, mē′lō (Greece).
Milwaukee, mĭl-wạ′kē.
Mindanao, mēn-dä-nä′ō.
Mindoro, mēn-dō′rō.
Minneapolis, mĭn-ẹ-ăp′ọ-lĭs.
Minnehaha, mĭn-ẹ-hä′hä.
Minnesota, mĭn-ẹ-sō′tạ.
Mississippi, mĭs-ĭs-ĭp′ĭ.
Missoula, mĭz-o͞o′la.
Missouri, mĭs-o͞o′rĭ.
Mitylene, mĭt-ē-lē′nē.
Mobile, mō-bēl′.
Mocha, mō′kạ.
Mohammed, mō-hăm′mĕd.
Mohave, mō-hä′vā.
Mohawk, mō′hạk.
Molokai, mō-lō-kī′.
Moluccas, mō-lŭk′ạz.
Mombasa, mŏm-bäs′ạ.
Monaco, mŏn′ä-kō.
Monastir, mŏn-ạs-tẽr′.
Moncton, mŭnk′tọn.
Mongolia, mŏn-gō′lĭ-ạ.
Monongahela, mō-nŏn-gạ-hē′lạ.
Monrovia, mŏn-rō′vĭ-ạ.
Montana, mŏn-tă′nạ.
Montauk, mŏn-tạk′.
Mont Blanc, mōn blŏn′ *or* mount blăn̲k.
Mont Cenis, mōn′sẹ-nē′ *or* mount.
Montenegro, mŏn-tā-nā′grō.
Monterey, mŏn-tẹ-rā′.
Montevideo, mŏn-tē-vĭd-ē′ō.
Montgomery, mọnt-gŭm′ẹr-ĭ.
Monticello, mŏn-tē-sĕl′lō.
Montpelier, mŏnt-pē′lĭ-ẹr.
Montreal, mŏnt-rẹ-ạl′.
Moraine, mō-rān′.
Moravia, mō-rā′vĭ-ạ.
Moray, mŭr′ā.
Morelia, mō-rā′lē-ạ.
Morocco, mō-rŏk′ō.
Moscow, mŏs′kō.
Mount Lyell, -lī′ĕl.
Mount McKinley, -mạ-kĭn′lĭ
Mount St. Elias, -ẹ-lī′ạs.
Mount Tyndall, -tĭn′dạl.
Mozambique, mō-zạm-bēk′.
Mukden, mo͞ok-dĕn′.
Munich, mū′nĭk.
Murray, mŭr′rā.
Muskatine, mŭs-kạ-tēn′.
Muskegon, mŭs-kē′gọn.

Namur, nā′mûr.
Nanling, nän′lĭng.
Nantes, năn̲ts.
Nanticoke, năn′tĭ-cōk.
Nantucket, năn-tŭk′ẹt.
Naples, nā′plz.
Narragansett, năr-rạ-găn′sẹt
Nashua, năsh′ū-ạ.
Nassau, năs′ạ.
Natchez, nă′chẹz.
Navajo, nä′vä-hō.
Naxos, năk′sŏs.
Nebraska, nẹ-brăs′kạ.
Neches, nĕch′ĕz.
Negritos, nē-grī′tōs.
Negros, nā′grōs.
Nepal, nā-päl′.
Netherlands, nĕth′ẹr-lạndz.
Neuse, nūs.
Nevada, nẹ-vä′dạ.
Newark, nū′ạrk.
Newfoundland, nū′fụnd-lạnd.
New Guinea, -gĭn′ē.
New Hampshire, -hămp′shịr.
New Orleans, -ôr′lẹ-ạnz.
New Zealand, -zē′lạnd.
Niagara, nī-ăg′ạ-rạ.
Nicaragua, nē-kä-rä′gwä.
Nice, nēs.
Niger, nī′jẹr.
Nigeria, nī-jēr′ĭ-ạ.
Niihau, nē-how′.
Nimes, nēm.
Niobrara, nī-ō-brä′rạ.
Nizhni Novgorod, nĭzh′nĭ nŏv′gō-rŏd.
Nome, nōm.
Norfolk, nôr′fọk.
Norristown, nŏr′ĭs-town.
Norway, nôr′wā.
Norwegian, nôr-wē′jĭ-ạn.
Norwich, nôr′wĭch (U. S.); nŏr′rĭj (Eng.).
Nottingham, nŏt′ĭng-ạm.
Nova Scotia, nō′vạ skō′shĭ-ạ.
Nova Zembla, nō′vạ zĕm′blạ.
Nubia, nū′bĭ-ạ.
Nueces, nwā′sẽs.
Nuevitas, nwā-vē′täs.
Nuremberg, nū′rĕm-bẽrg.
Nyanza, nī-än′zạ.
Nyassa, nē-äs′sä.

Oahu, ō-ä′ho͞o.
Oakland, ōk′lạnd.
Oaxaca, wä-hä′kä.
Ob, ŏb.
Ocmulgee, ŏk-mŭl′gē.
Oder, ō′dẹr.
Odessa, ō-dĕs′sạ.
Ogden, ŏg′dĕn.
Ogeechee, ō-gē′chē.
Okanogan, ō-kăn′ọ-gạn.
Okechobee, ō-kē-chō′bē.
Okefinokee, ō-kē-fĭ-nō′kē.
Okhotsk, ō-kōtsk′.
Oklahoma, ōk-lä-hō′mạ.
Oldham, ōld′ạm.
Olympia, ō-lĭm′pĭ-ạ.
Olympus, ō-lĭm′pŭs.
Omaha, ō′mạ-hạ.

Oman, ō-män′.
Omsk, ŏmsk.
Onega, ō-nē′gą.
Oneida, ō-nī′dą.
Ontario, ŏn-tā′rĭ-ō.
Oporto, ō-pōr′tō.
Oran, ō-rän′.
Oregon, ŏr′ę-gŏn.
Organ, ôr′gąn.
Orinoco, ō-rĭ-nō′kō.
Orizaba, ō-rē-sä′bä.
Orkney, ôrk′nē.
Orleans, ŏr-lā-ŏNs′ (Fr.).
Osage, ō-sāj′.
Osaka, ō′zä-kä.
Oshkosh, ŏsh′kŏsh.
Oswego, ŏs-wē′gō.
Otranto, ō-trän′tō.
Ottawa, ŏt′tą-wą.
Ottoman, ŏt′tǫ-mąn.
Ottumwa, ŏt-tŭm′wą.
Ouachita, wŏsh′ĭ-tą.
Ouse, ōōz.
Owyhee, ō-wī′hē.
Ozark, ō-zärk′.

Pacaraima, pä-kä-rī′mä.
Pachuca, pä-chōō′kä.
Pacific, pą-sĭf′ĭk.
Paducah, pą-dū′ką.
Pagan, pā′gąn.
Pago, pä′gō.
Pagoda, pä-gō′dä.
Paisley, pāz′lĭ.
Palawan, pä-lä′wän.
Palembang, pä-lĕm-bäng′.
Palermo, pą-lĕr′mō.
Palestine, păl′ęs-tīn.
Pamir, pä-mēr′.
Pamlico, păm′lĭ-kō.
Pampanga, päm-pän′gä.
Pampas, päm′päs.
Panama, păn-ą-mä′.
Panay, pä-nī′.
Papuan, păp′ū-ąn.
Para, pä-rä′.
Paragua, pä-rä′gwä.
Paraguay, pä-rä-gwī′.
Paramaribo, păr-ą-măr′ĭ-bō.
Parana, pä-rä-nä′.
Paris, păr′ĭs.
Parma, pär′mą.
Parsee, pär′sē.
Parthenon, pär′thē-nŏn.
Pascagoula, păs-ką-gōō′lą.
Pasig, pä-sēk′.
Passaic, păs-sā′ĭk.
Patagonia, păt-ą-gō′nĭ-ą.
Paterson, păt′ęr-sǫn.
Patras, pä-träs′.
Pawtucket, pą-tŭk′ęt.
Pecos, pē′kōs.
Pedee, pē-dē′.
Peking, pē-kĭng′.
Peling, pē-lĭng′.
Pennine, pĕn′nīn.
Pennsylvania, pĕn-sĭl-vā′nĭ-ą.
Penobscot, pę-nŏb′scǫt.
Pensacola, pĕn-są-kō′lą.
Pentland, pĕnt′ląnd.
Peoria, pē-ō′rĭ-ą.
Pepin, pē′pĭn.
Pernambuco, pĕr-näm-bōō′kō.
Persia, pĕr′shĭ-ą.
Perth, pĕrth.
Peru, pę-rōō′.
Philadelphia, fĭl-ą-dĕl′fĭ-ą.
Philæ, fī′lē.
Philippine, fĭl′ĭp-ĭn.
Philippopolis, fĭl-ĭp-ŏp′ō-lĭs.
Phœnix, fē′nĭks.
Piedmont, pēd′mŏnt.
Pierre, pēr.
Pietermaritzburg, pē-tęr-mâr′ĭts-bŭrg.
Pike, pīk.
Pilcomayo, pĭl-kō-mī′ō.
Pilsen, pĭl′sęn.
Pinar del Rio, pē-när′ dĕl rē′ō.
Pindus, pĭn′dŭs.
Pinos, pē′nōs.
Piræus, pī-rē′ŭs.
Pittsburg, pĭts′bûrg.
Plata, plä′tä.
Platten See, plä′tęn zā.
Plymouth, plĭm′ŭth.
Pnum Penh, p'nŭm pĕn.
Polyp, pŏl′ĭp.
Pomona, pō-mō′ną.
Pompeii, pŏm-pā′yē.
Ponce, pōn′sā.
Pontchartrain, pŏn-chąr-trān′.
Popocatepetl, pō-pō-kät-ā-pā′-tl.
Port au Prince, pôrt ō prĭns′.
Porto Rico, pōr′tō rē′kō.
Port Said, -sä-ēd′.
Portsmouth, pōrts′mŭth.
Portugal, pōr′tū-gąl.
Portuguese, pōr′tū-gēz.
Potomac, pō-tō′mąk.
Potosi, pō-tō-sĭ′.
Poughkeepsie, pǫ-kĭp′sĭ.
Prague, prāg.
Pressburg, prĕs′bōōrg.
Pretoria, prē-tōr′ē-ą.
Pribilof, prē-bē-lŏf′.
Prussia, prŭsh′yą.
Pruth, prōōth.
Puebla, pwĕb′lä.
Pueblo, pwĕb′lō.
Puerto Principe, pwĕr′tō prĭn′sē-pā.
Puget, pū′jęt.
Puno, pōō′nō.
Pyrenees, pĭr′ę-nēz.

Quagga, kwăg′gą.
Quebec, kwę-bĕk′.
Queretaro, kā-rā′tä-rō.
Quincy, kwĭn′zĭ *or* -sĭ.
Quito, kē′tō.

Racine, rą-sēn′.
Rainier, rā′nēr.
Raleigh, rą′lę.
Rangoon, răn-gōōn′.
Rappahannock, răp-ą-hăn′ǫk.
Ravenna, rą-vĕn′ą.
Reading, rĕd′ĭng.
Rennes, rĕn.
Rheims, rēmz.
Rhine, rīn.
Rhone, rōn.
Riga, rī′gą (U.S.); rē′gä (Rus.).
Rio Cauto, rē′o kow′tō.
Rio de Janeiro, -jä-nā′rō.
Rio Grande, rē′ō grän′dā.
Rio Negro, -nā′grō.
Rio Virgen, -vēr′hĕn.
Roanoke, rō-ą-nōk′.
Rochelle, rǫ-shĕl′.
Rochester, rŏch′ęs-tęr.
Romano, rō-mä′nō.
Romanzof, rō-män′tsŏf.
Rosario, rō-sä′rē-ō.
Rotterdam, rŏt′ęr-dăm.
Rouen, rōō′ŏN′.
Roumelia, rōō-mē′lę-ą.
Roumania, rōō-mā′nĭ-ą.
Russia, rŭsh′ą.

Saco, są′kō.
Sacramento, săk-rą-mĕn′tō.
Saginaw, săg′ĭ-ną.
Sagua la Grande, sä′gwä lä grän′dā.
Sahara, sä-hä′rą.
Saigon, sä′ē-gŏn.
Saint Albans, sānt ąl′bąnz.
Saint Augustine, -ą′gŭs-tēn.
Saint Bernard, -bĕr-närd′.
Saint Clair, -klâr′.
Saint Croix, -kroi′.
Saint Gotthard, gō-tärd′.
Saint Helena, sĕnt hę-lē′ną.
Saint Lawrence, sānt lą′rens.
Saint Louis, -lōō′ĭs *or* -lōō′ĭ.
Saint Petersburg, -pē′tęrz-bûrg.
Saint Roque, -rōk.
Saint Sophia, -sō-fē′ä.
Sakhalin, sä-kä-lēn′.
Salinas, są-lē′nąs.
Salisbury, sąlz′bęr-ĭ.
Saloniki, sä-lō-nē′kē.
Saltillo, säl-tē′yō.
Salvador, säl-vä-dōr′.
Salzburg, sälts′bōōrg.
Samar, sä-mär′.
Samarkand, säm-ąr-känd′.
Samoa, sä-mō′ä.
San Antonio, sän än-tō′nĭ-ō.
San Bernardino, -bĕr-när-dē′nō.
San Cristobal, -krēs-tō′bäl.
Sancti Spiritus, săngk′tĭ spĭ′rĭ-tŏōs.
Sandhurst, sănd′hurst.
San Diego, săn dē-ā′gō.
Sandusky, săn-dŭs′kĭ.
San Francisco, -frăn-sĭs′kō.
Sangamon, săn′gą-mŏn.
Sangay, sän-gī′.
San German, sän hĕr-män′.
Sangre de Cristo, sän′grā dā krēs′tō.
San Joaquin, săn hō-ä-kēn′.
San Jose, -hō-sā′.
San Juan, -hōō-än′.
San Lucas, -lōō′kąs.
San Luis, -lōō-ēs′.
San Marino, -mä-rē′nō.
San Pablo, -pä′blō.
Santa Barbara, săn′tą bär′bą-rą.
Santa Cruz, -krōōs.
Santa Fe, -fā.
Santee, săn-tē′.
Santiago, sän-tē-ä′gō.
Santo Domingo, sän′to dō-mĭn′gō.
Santos, sän′tōs.
Saone, sōn.
Saratoga, săr-ą-tō′gą.
Sarawak, sä-rä′wäk.
Sardinia, sär-dĭn′ĭ-ą.
Saskatchewan, săs-kăch′ę-wąn.
Sault Sainte Marie, sōō sĕnt mā′rĭ.
Savaii, sä-vī′ē.
Savannah, są-văn′ą.
Save, säv.
Scandinavia, skăn-dĭ-nā′vĭ-ą.
Schenectady, skę-nĕk′tą-dē.
Schwarzwald, shvärtz′vält.
Scilly, sĭl′ĭ.
Scotland, skŏt′ląnd.
Scranton, skrăn′tǫn.
Seattle, sē-ăt′l.
Sedalia, sē-dā′lĭ-ą.
Seine, sān.
Selvas, sĕl′vąs.
Seminole, sĕm′ĭ-nōl.
Semite, sĕm′ĭt.
Semitic, sē-mĭt′ĭc.
Seneca, sĕn′ę-ką.
Senegal, sĕn-ę-gąl′.
Senegambia, sĕn-ę-găm′bĭ-ą.
Seoul, sā-ōōl′.
Serra do Mar, sār′rä dō mär′.
Servia, sĕr′vĭ-ą.
Severn, sĕv′ęrn.
Sevier, sę-vēr′.
Seville, sĕv′ĭl, or sā-vĭl′yā.
Shamokin, shą-mō′kĭn.
Shanghai, shăng-hä′ĭ.
Shannon, shăn′ǫn.
Shasta, shăs′tą.
Sheffield, shĕf′fēld.
Shenandoah, shĕn-ăn-dō′ą.
Shetland, shĕt′ląnd.
Shoshone, shō-shō′nē.
Shreveport, shrēv′pōrt.
Siam, sī-ăm′.
Siberia, sī-bē′rĭ-ą.
Sicily, sĭs′ĭ-lĭ.
Sierra Madre, sē-ĕr′ą mä′drā.
Sierra Nevada, -nā-vä′dä.
Singapore, sĭn-gą-pōr′.
Sioux, sōō.
Sisal, sĭs′ąl.
Sitka, sĭt′ką.
Smyrna, smĕr′ną.
Snowdon, snō′dǫn.
Sofia, sō-fē′ä.
Sogne, sōn.
Sokoto, sō-kō-tō′.
Solway, sōl′wā.
Somali, sō-mä′lē.
Somerville, sŭm′ęr-vĭl.
Souris, sōō-rē′.
Spokane, spō-kăn′.
Stabiæ, stā′bĭ-ē.
Staffa, stăf′ą.
Stanovoi, stä-nō-voi′.
Steppes, stĕps.
Stettin, stĕt-tēn′.
Steubenville, stū′bęn-vĭl.
Stirling, stēr′lĭng.
Stockholm, stŏk′hōlm.
Strassburg, străz′bûrg.
Streator, strē′tor.
Stuttgart, stōōt′gärt.
Suakin, swä′kĭn.
Subic, sōō-bēk′.
Sucre, sōō′krę.
Sudan, sōō-dän′.
Sudanese, sōō-dän-ēz′.
Suez, sōō-ĕz′.
Suisun, sōō-ē-sōōn′.
Suliman, sōō-lē-män′.
Sulu, sōō-lōō′.
Sumatra, sōō-mä′trä.
Sunda, sŭn′dą.
Sunderland, sŭn′dęr-ląnd.
Susquehanna, sŭs-kwę-hăn′ą.
Suwanee, sū-wą′nē.
Swansea, swŏn′sē.
Sweden, swē′dęn.
Switzerland, swĭt′zęr-ląnd.
Sydney, sĭd′nĭ.
Syra, sē′rä.
Syracuse, sĭr′ą-kūs.
Syria, sĭr′ĭ-ą.

Tabriz, tä-brēz′.
Tacoma, tä-kō′mä.
Tagus, tā′gŭs.
Tahlequah, tä′lē-kwä.
Tahoe, tä-hō′.
Tallahassee, tăl-ą-hăs′ē.
Tampa, tăm′pą.
Tampico, tăm-pē′kō.
Tananarivo, tä-nä′nä-rē-vō.
Tanganyika, tän-gän-yē′kä.
Taranto, tä′rän-tō.
Tarim, tä-rēm′.
Tashkend, täsh-kĕnt′.
Tasmania, tăz-mā′nĭ-ą.
Taunton, tän′tǫn.
Taurus, tą′rŭs.
Tchad, chäd.
Tegucigalpa, tā-gōō-sē-gäl′pä.
Teheran, tę-hrän′.
Tehuantepec, tā-wän-tā-pĕk′.
Tennessee, tĕn-nęs-sē′.
Terre Haute, tĕr-ę hōt′.
Texas, tĕx′ąs.
Thames, tĕmz (Eng.).
Thian Shan, tē-än′ shän.
Tiber, tī′bęr.
Tibet, tĭ-bĕt′ *or* tĭb′ĕt.
Tibetan, tĭb′ē-tąn.
Tientsin, tē-ĕnt′sēn.
Tierra del Fuego, tē-ĕr′rä dĕl fwā′gō.
Tiflis, tĭf-lēs′.
Tigris, tī′grĭs.
Timbuktu, tĭm-bŏŏk′tōō.
Timor, tē-mōr′.
Titicaca, tĭt-ē-kä′kä.
Tocantins, tō-kän-tēns′.
Tokyo, tō′kē-ō.
Toledo, tō-lē′dō.
Tolima, tō-lē′mä.
Tombigbee, tŏm-bĭg′bē.
Tonga, tŏn′gą.
Topeka, tō-pē′ką.
Toronto, tō-rŏn′tō.
Torrens, tŏr′rĕnz.
Tortola, tôr′tō-lä.
Toulon, tōō′lŏN.
Toulouse, tōō-lōōz′.
Trans-Caucasia, -ką-kā′shĭ-ą.
Transvaal, trăns-väl′.
Trieste, trē-ĕst′ą.
Trinidad, trĭn-ĭ-dăd′.
Tripoli, trĭp′ǫ-lĭ.
Tucson, tū-sŏn′.
Tulare, tōō-lä′rē.
Tunis, tū′nĭs.
Turin, tū′rĭn.
Turkestan, tōōr-kĭs-tän′.
Tutuila, tōō-twē′lä.

Ucayali, ōō-kī-ä′lē.
Uinta, ū-ĭn′tą.
Ujiji, ōō-jē′jē.
Upolu, ōō-pō-lōō′.
Ural, ū′răl.
Uruguay, ōō-rōō-gwī′.
Uspallata, ōōs-pä-yä′tä.
Utah, ū′tä *or* ū′tą.
Utica, ū′tĭ-ką.

Valdai, väl′dī.
Valencia, vą-lĕn′shĭ-ą.
Valparaiso, väl-pä-rī′sō.
Vancouver, văn-kōō′vęr.
Venezuela, vĕn-ę-zwē′lą.
Venice, vĕn′ĭs.
Vera Cruz, vā′rä krōōs′.
Verde, vĕrd.
Verkoyansk, vĕr-kō-yänsk′.
Vermilion, vęr-mĭl′yŭn.
Vermont, vęr-mŏnt′.
Verona, vę-rō′ną.
Vesuvius, vĕ-sū′vĭ-ŭs.
Vienna, vē-ĕn′ą (Aus.).
Vincennes, vĭn-sĕnz′.
Virginia, vęr-jĭn′ĭ-ą.
Vistula, vĭs′tū-lą.
Viti Levu, vē′tē lā′vōō.
Vladivostok, vlä-dē-vŏs-tŏk′.
Volga, vŏl′gä.
Vosges, vōzh.

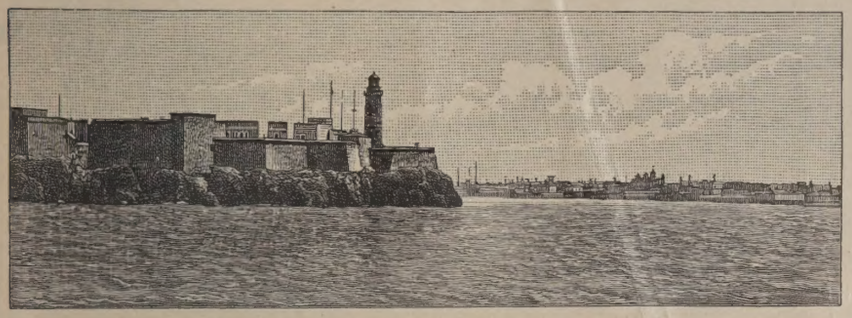
Wabash, wą′bąsh.
Wachusett, wą-chū′sęt.
Waco, wā′kō.
Wadai, wä′dī.
Wales, wālz.
Warsaw, wąr′są.
Wasatch, wą′săch.
Waterloo, wą-tęr-lōō′.
Weihaiwei, wā-ē-hī-wā′ē.
Welland, wĕl′ąnd.
Wellington, wĕl′ĭng-tǫn.
Wenner, vā′nęr.
Westminster, wĕst′mĭn-stęr.
Wichita, wĭch′ĭ-tą.
Wilkesbarre, wĭlks′băr-ĭ.
Willamette, wĭl-ă′mĕt.
Wilmington, wĭl′mĭng-tǫn.
Winnebago, wĭn-ē-bā′gō.
Winnemucca, wĭn-ē-mŭk′ą.
Winnepesaukee, wĭn-ē-pę-są′kē.
Winnipeg, wĭn′ĭ-pĕg.
Winona, wī-nō′ną.
Winooski, wī-nōōs′kĭ.
Wisconsin, wĭs-kŏn′sĭn.
Woonsocket, wōōn-sŏk′ęt.
Worcester, wōōs′tęr.
Wyoming, wī-ō′mĭng.

Yablonoi, yä-blō-noi′.
Yadkin, yăd′kĭn.
Yakima, yăk′ĭ-mä.
Yakutsk, yä-kōōtsk′.
Yangtze, yăng′tsē.
Yarkand, yär-känd′.
Yazoo, yä-zōō′.
Yenisei, yĕn-ē-sā′ē.
Yesso, yĕs′sō.
Yokohama, yō-kō-hä′mä.
Yonkers, yŏnk′ęrs.
Yosemite, yō-sĕm′ĭ-tē.
Yucatan, yōō-kä-tän′.
Yukon, yōō′kŏn.
Yuma, yōō′mä.

Zacatecas, zäk-ą-tā′kąs.
Zambezi, zäm-bā′zę.
Zambezia, zäm-bē′zē-ą.
Zamboanga, zäm-bō-än′gä.
Zanesville, zānz′vĭl.
Zante, zän′tä.
Zanzibar, zän′zĭ-bär.
Zuider Zee, zoi′dęr zā′.
Zululand, zōō′lōō-ląnd.
Zurich, tsū′rĭk.

Cuba, Porto Rico, Hawaii, Philippines, Guam.

The long chains of islands that separate the Atlantic ocean from the gulf of Mexico and the Caribbean sea are called the *West Indies.* These islands are in several groups, the most northern being the *Bahamas;* next in order follow the great islands of Cuba, Haiti, Jamaica and Porto Rico,[1] with their border islets, together forming the *Greater Antilles;* lastly, many smaller islands, known as the *Lesser Antilles,*[2] extend from Porto Rico almost to the coast of South America.



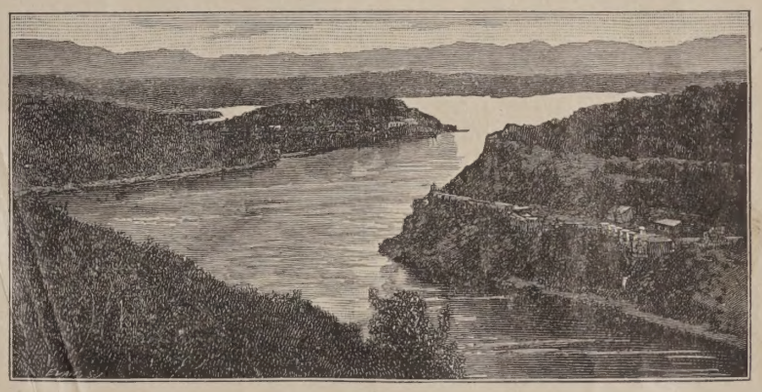
Morro Castle; Entrance to Havana Harbor.

At the close of the recent war with Spain, Porto Rico (with its border isles) was ceded to the United States; Spain also gave up all claim to Cuba and its border isles, and Cuba is now a republic under the protection of our country.

Cuba. Cuba, the "Queen of the Antilles," is the largest island of the West Indies. In shape it looks like a cornucopia. Its length is about 750 miles. The island is about 130 miles from the mainland of Florida, and slightly less from Yucatan. The area is 43,000 square miles — almost as large as Pennsylvania, or nearly nine times as large as Connecticut. Cuba may be roughly divided into three regions — mountainous in the east, hilly in the middle, level in the west or southwest. The highest mountain range, known as the *Sierra Maestra,* follows the southeast coast. Its general crest is about 4000 feet high, with a few peaks about twice as high. Guantanamo bay is near the eastern end of this range; Santiago, before which our soldiers fought with such courage, is at the southern base of the range. Towards the west the highland is rugged, with hill ranges and deep valleys, but not so high as the Sierra Maestra. The middle hill district is famous for its beauty. Broad fertile fields occupy the greater portion of southwest Cuba, and form the best agricultural region of the island. The rivers are numerous but small.

The coast of Cuba is largely fringed with coral reefs, rocks and sand bars, making navigation difficult and dangerous; but there are also many excellent harbors, ranking among the finest in the world. Of these Havana is the best known.

Cuba is in the torrid zone, and its lowlands have hot or warm weather almost all the year. As in other parts of this zone, the rainy season comes during the hottest part of the year, here lasting from May to November. The lowlands are then very unhealthful, being subject to the scourges of yellow and malarial fevers. Long cool nights and sea breezes help to temper this torrid climate, while the hilly region affords refuge from the hot and unhealthful coast lands. Among the hills and mountains in nearly all parts of the West Indies a fairly mild climate is found at the height of 2000 feet and upwards. "Winter," or the dry season, is the pleasant season in these islands.



Entrance to Santiago Harbor.

Cuban Village near Santiago.

With high temperature and abundant rainfall, vegetation in Cuba is luxuriant. The hill and mountain slopes are a tangle of shrubs and scrubby trees, with forests of lofty mahogany and ebony trees in the southeast. Roadways in this island are very poor, being often overgrown with thicket. Few people live in the inland portions of the hilly or moun-

[1] The name *Puerto Rico* is often used. It is the true form of the Spanish name, meaning *rich port.* An Act of Congress has established the corrupt form, *Porto Rico,* as the name of the island. For pronunciation of names see page 7.

[2] Many of the Lesser Antilles belong to the British nation, and that nation has *officially* (for purposes of government) divided the islands into the *Leeward islands* — from the Virgin isles to Dominica; the *Windward islands* — southward to Grenada; with Barbados as a third separate colony, and with Trinidad and Tobago as a fourth colony.

Sailors often refer to the outer chain of islands in the Lesser Antilles, fronting the Atlantic and in the direct path of the trade winds, as the *Windward islands;* they also apply the name *Leeward* to the islands along the coast of Venezuela. This use of the names should not be confused with the official division into colonies, as shown on the map.

Copyright, 1899, 1902, by Alexis Everett Frye.

WEST INDIES
SCALE OF MILES
0 50 100 200 300 400
PORTO RICO
and Neighboring Islands
SCALE OF MILES
0 10 20 30
HAVANA
SCALE
0 ¼ ½ 1
BERMUDA
SCALE OF MILES
0 1 2 3 4 5 10
COMPARATIVE AREA
CONNECTICUT
4,990 SQ. MILES
ATLANTIC OCEAN
CARIBBEAN SEA
GULF OF MEXICO
GREAT BAHAMA BANK
CUBA
JAMAICA
HAITI
SANTO DOMINGO
PORTO RICO
VIRGIN ISLANDS
LESSER ANTILLES
WINDWARD ISLANDS
LEEWARD ISLANDS
HONDURAS
NICARAGUA
COSTA RICA
COLOMBIA
VENEZUELA
SOUTH AMERICA
COLON TERRITORY
Longitude West from Greenwich

tainous districts, there vegetation runs wild. Along the coasts of these districts, however, and even on some of the higher slopes, fruits and coffee abound. The latter thrives best on the hillsides.

The broad fields of the middle and western provinces of the island are very fertile, but during the war for Cuban freedom the plantations were mostly ruined, crops were destroyed and buildings burned, Now that Cuba is free from Spain, a few years will witness the growth of new plantations in this fertile country.

Homes in a Cuban Village

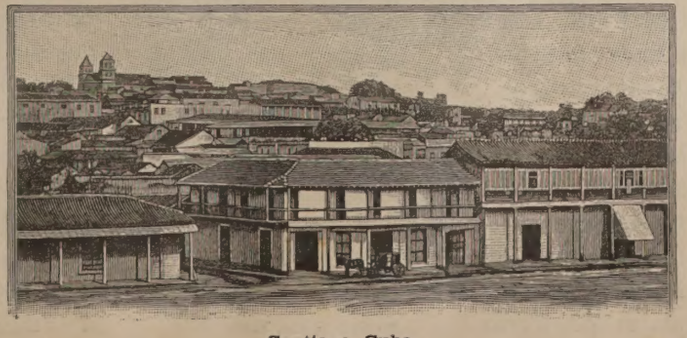
Richest of all are the plains or *savannahs* of the west and southwest portions of the island. Here are found most of the great sugar and tobacco plantations for which Cuba is famous. Fruits also grow in abundance in all parts of the islands.

Hill District seen from Mayaguez Harbor, Porto Rico.

When white men first went to the West Indies, they found there none of the great mammals so common elsewhere in America. Of course the islands are now well stocked with domestic animals. Birds of beautiful plumage are plentiful. Fish and turtles abound and are valuable food products.

Cutting Sugar Cane Porto Rico

Iron and copper are valuable mineral products of Cuba. The early explorers found in Cuba many tribes of peaceful Indians, numbering in all perhaps a million people. During the first hundred years of Spanish rule this vast population disappeared. Other Indians were imported only to die in slavery. After a time large numbers of African Negroes were taken to Cuba as slaves. Slavery no longer exists in the island, but



Santiago, Cuba

tully one third of the people are Negroes; the other two thirds include the white people, the mixed races and several thousand coolies, or laborers from China and the East Indies.

The people are gathered chiefly in the coast cities and the fertile lands of the western half of the island. In 1899 the population was 1,572,797, according to the census of the War Department.

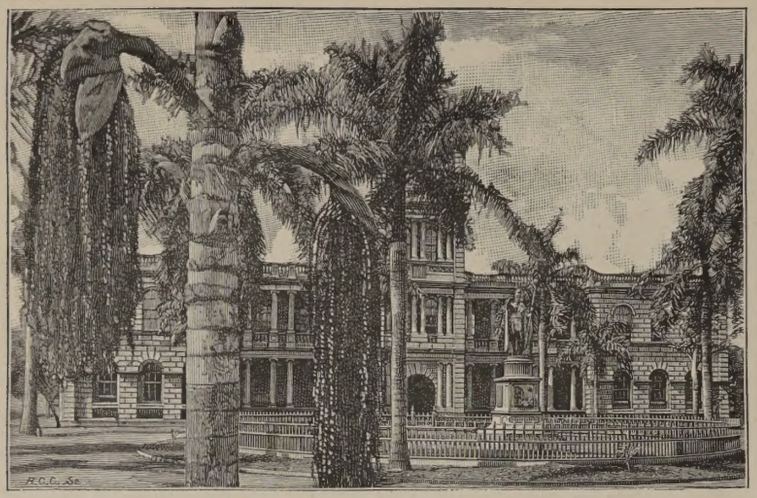
Havana is the capital and largest city of Cuba. It contains one sixth of the people of the island. This is also the railroad center, as well as the chief port. Havana owes its growth largely to its fine harbor, its nearness to the rich plantations of western Cuba, its nearness to the United States, and the fact that it has long been the capital of the island. The principal exports are cane sugar and tobacco. Most of the exports go to the United States.

Santiago is the second largest city in Cuba, and is the leading port of the eastern province. With the destruction of the Spanish fleet when trying to escape from Santiago bay, and with the surrender of Santiago itself, the power of Spain in the New World was broken. The other principal ports of Cuba are: **Cienfuegos,** on the south coast; **Matanzas** and **Cardenas,** east of Havana. **Puerto Principe** and **Holguin** rank among the large cities.

Street Scene, Mayaguez, Porto Rico.

PORTO RICO. Porto Rico has in general the shape of a rectangle. It is about 100 miles in length by 36 in breadth, and is about three fourths as large as Connecticut.

This island has no high mountains, — its loftiest peak being only

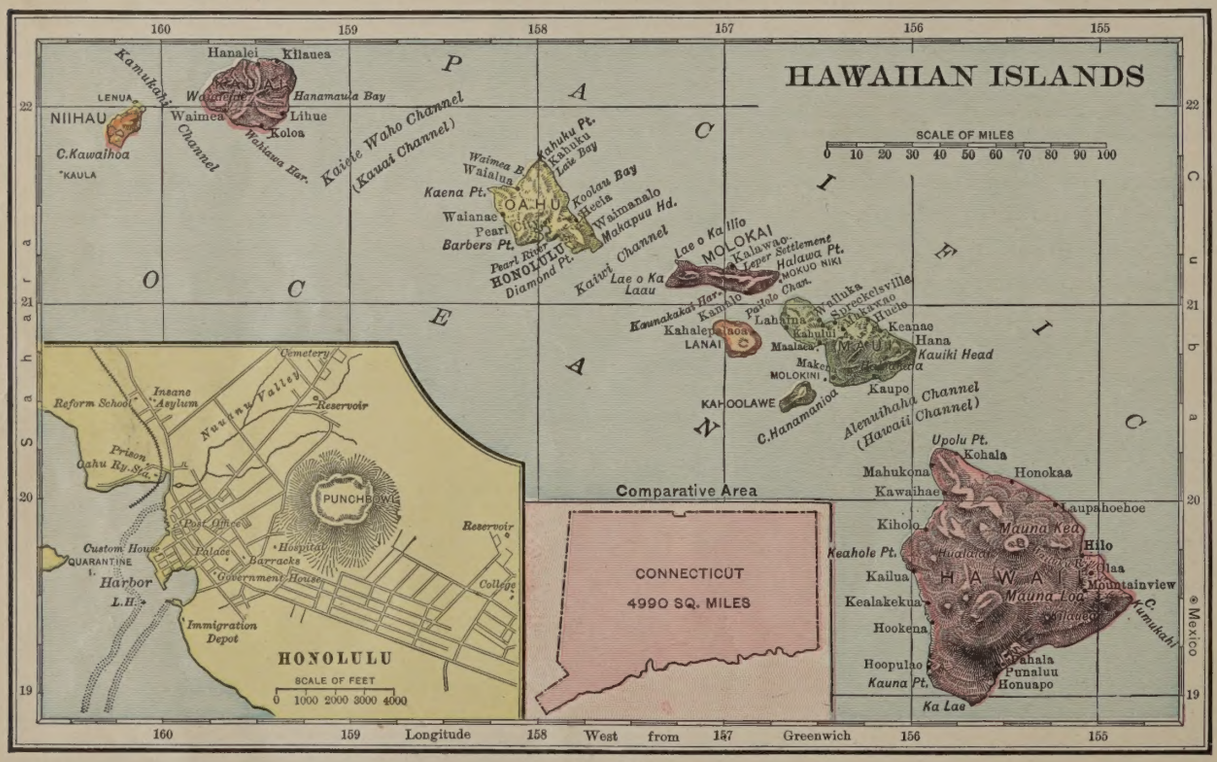


Government Building, Honolulu.

Lake of Lava, Hawaii.

Rico are very fertile and contain most of the cities and towns. By far the most valuable product is coffee, which thrives on the gentle hillsides. Next in value is sugar; molasses and tobacco are also valuable exports. Among the chief imports are cloth and metal wares. The small island of Porto Rico contains more than half as many people as Cuba. This fact shows that the former island is the better cultivated. Out of a total of 953,243 people, more than one third are Negroes, mostly descendants of former slaves.

three fourths of a mile in height. For the most part the inland regions are hilly, with wooded ridges running east and west, sending small rivers to the seacoast on all sides. A broad



Hawaiian Islands.

San Juan is the chief city of Porto Rico, though not the largest. It is built on a fine harbor on the north coast, and is the capital of the island.

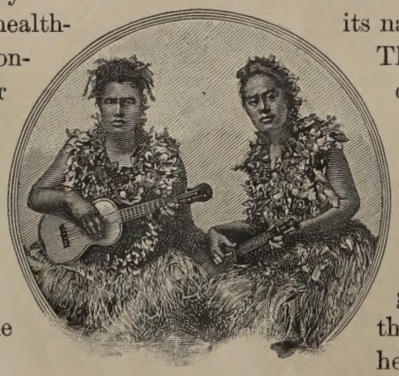
Ponce, the largest city near the south coast, is connected with the capital by a military road running across the island. **San German, Mayaguez, Aguadilla,** near the west coast; **Arecibo,** on the north; and **Guayama,** on the south, are other important trade centers.

belt of coastal region consists of level tracts, or savannahs, alternating with uneven ridgy areas. Porto Rico, like Cuba, is in the torrid zone and has the wet and the dry seasons of that zone; but Porto Rico is noted for its healthful climate, in contrast with other islands of the West Indies. The beautiful hill regions afford relief from the intense summer heat of the lowlands.

Native Hut, Hawaii.

The river valleys and coast plains of Porto

HAWAII. Far out in the Pacific, in about the same latitude as Cuba and Porto Rico, and about 2000 miles from San Francisco, lie the islands of the Hawaiian group. There are eight principal islands and a number of rocky islets in the group. The total area is about 6449 square miles. The large island of Hawaii embraces three fifths of this area and gives its name to the entire group. Thus it is proper to speak of the group as Hawaii or as the Hawaiian islands. The islands extend northwest and southeast for about 400 miles. They are of volcanic origin, and are built up from the ocean bottom, which is here 16,000 to 18,000 feet below the surface of the sea.



Native Girls, Hawaii.

Shrimp Fisher.

On the island of Hawaii rise two of the highest peaks in all the Pacific isles — the volcanoes of Mauna Kea (13,800 feet) and Mauna Loa (13,600 feet). The height of these peaks from the ocean bottom is greater than the height of Mt. Everest above sea level. Mauna Loa is active. On its east slope is the huge active crater of Kilauea, world-famed for its size and for the grandeur of its seething lake of molten lava. There are other active craters on the island, and earthquakes are frequent. Several violent eruptions have taken place in recent years both on the land and in the border bays. Thousands of persons visit Hawaii every year to study the volcanoes and hot springs, as well as to observe the people and enjoy the mild climate.

Street Scene in Manila.

Though most parts of the islands are rugged with cones, ridges and other forms of old lava flows, there are also many open valleys of great fertility. The rich soil is well watered,

Hemp Press, Manila.

and the vegetation is luxuriant. Tropical fruits abound; sugar and rice are the chief exports.

The natives of Hawaii are a happy, light-hearted race, resembling in features the Maoris, or brown people of New Zealand. The Hawaiians are more intelligent than any other natives of the Pacific islands. When Captain Cook visited the islands, about a century ago, the number of natives there was about 200,000. Only about one sixth of the number now remain, though the total population is 154,000. There are about 10,000 half-castes, 25,000 Chinese, 60,000 Japanese, 15,000 Portuguese, 6000 Americans and several thousand white people of other nations. There are many schools in Hawaii, and the children receive a fair education.

Various chiefs, kings and queens ruled Hawaii until July 4, 1894, when the white people of the islands formed a republic. In 1898 the islands were annexed to the United States.

Honolulu. This city is the capital and chief port of the islands. It is finely located on a deep harbor on the south side of Oahu. The largest ocean steamers can lie along the great quays, to load or unload. In recent years Honolulu has made rapid progress. It has good schools, tramways, electric lights, telephones, beautiful public buildings and homes. Owing to its mild even climate, this city is a favorite resort for tourists. It has good steamship connections with San Francisco and the Orient.

Hilo is an important town on the island of Hawaii.

The island of Molokai contains a leper settlement. Leprosy is the worst scourge among the natives, and the victims are sent to Molokai to prevent the spread of the disease.

Family of Negritos.

PHILIPPINES. Another group of tropical islands, the Philippines, came under the protection of the United States at the close of the war with Spain. This great archipelago was discovered by Magellan during the famous first voyage round the world. Only one of his ships reached home; Magellan was killed in the Philippines.

This group of islands is southeast of Asia and partly encloses the China sea. There are eleven principal islands in the group. The largest is Luzon, with an area nearly equal to that of New York; next in size is the southern island of Mindanao, nearly as large. The total area of the group is about 127,853 square miles — an area about equal to that of all New England plus New York state. Being on the line of great volcanic activity, which is very marked between Japan and Java, the Philippines often suffer from eruptions and earthquakes. The islands are largely built of volcanic rock and contain active peaks, as well as hot springs, old and new lava flows, huge fissures and other proofs of former volcanic activity. The mountain ranges have in general a northerly trend, bending to the northwest in some of the islands. The highest peaks rise only a little more than a mile and a half above the sea.

Filipino Woman.

Though most parts of the islands are hilly or mountainous, there are river valleys, slopes and plains of wonderful fertility. Here, as in most tropical lands, the wet season comes in summer, — or from May to October, — with some rain during the other months. Lakes, rivers and smaller streams abound and combine with mountains and forests to give beauty to the scenery.

The climate of the Philippines is tropical, but with the great length of the archipelago north and south comes variety in heat and rainfall. The large island of Luzon and its smaller border isles have bright skies, with cool and

dry air, during the winter months. Even in summer the sea breezes and many cool nights bring relief. The climate of the northern islands is healthful. Most of the sickness among white people visiting them is caused by over-eating fruits, drinking alcoholic liquors or using fat, heat-giving foods. Care must also be taken to protect the body against sudden chills. The southern islands have of course hotter weather than the northern, but the former are free from the terrible storms, called *typhoons*, that sometimes sweep over the latter during the hot months.

With plentiful heat and moisture, these islands have luxuriant vegetation. Hills and plains alike are buried in foliage. Trees of many varieties yield dyes, gums and cabinet woods. The cocoanut palm and bamboo thrive throughout the islands, and are put to an infinite number of uses. The cocoanut is an important article of food for the natives. Here, as in Cuba, tobacco and sugar are leading products, but the staples for which the islands have long been noted are fine tobacco and *Manila hemp*, the latter being a fiber used for making rope and twine. This is not true hemp, but is the fiber of a kind of banana plant. It is hardy and grows best in the hilly regions and in the weathered volcanic soils. "The crude native implement for preparing the fiber is still the only one in use; it consists of a rough wooden bench with a long knife-blade hinged to it at one end and connected at the other to a treadle. Strips of the plant are drawn several times between this blade and the bench, which removes the pulp and outer skin, leaving the fiber, which is then cleansed by washing, dried in the sun, and packed for shipment." — *National Geographic Magazine, Washington, June, 1898.*

Large crops of rice are raised in the Philippines and used there for food. Bananas are also a staple food product. The orange, pineapple and other tropical fruits grow in abundance.

Although the neighboring island of Borneo has large wild animals, such as the elephant, the tapir and the orang-outan, these are not found in the Philippines. The only beasts of prey are small wildcats. The wild buffaloes and wild hogs in the islands are thought to have descended from tame animals that escaped to the woods. The most useful animal is the tame buffalo, known as the water buffalo, from its habit of rolling in water. It is used to draw the rude plows and carts, as well as to carry burdens on its back. Sheep and goats are also reared; monkeys, huge bats, birds, snakes and insects abound.

Careful study of the mineral resources has not yet been made, but it is known that gold, iron, copper, zinc, sulphur and coal promise a rich reward to future miners in the islands.

The primitive people of the Philippines are thought to be the *Negritos*, a dwarfish black race now found in the mountains of Luzon and Negros islands. They have the frizzly black hair, thick lips and wide nostrils, such as are seen among the black natives of New Guinea. The Negritos were long ago hunted from the lowlands, by stronger people of the brown race, — the Malays, — and now wander over the ranges and through the forests, without fixed homes, eating wild fruits and sleeping wherever they may be when darkness comes on.

Of the seven and one-half million natives of this archipelago, nearly all are Malays. In some parts of the islands they are called *Filipinos*. For the most part the natives are peaceable but brave, as well as honest and courteous.

The Malays of the cities and towns are bright and intelligent, but the people of forest and mountain tribes are "simple children of nature." On many of the islands the natives are little known, and some of them are fierce and warlike.

PHILIPPINE ISLANDS
SCALE OF MILES
0 50 100
COMPARATIVE AREA
CONNECTICUT 4990 SQ. MILES
LUZON
MINDORO
PANAY
NEGROS
SAMAR
LEYTE
MASBATE
CATANDUANES I.
PALAWAN I. (PARAGUA)
MINDANAO
JOLO (SULU) SEA
SOUTH CHINA SEA
CELEBES SEA
PACIFIC OCEAN
BRITISH NORTH BORNEO
MANILA
Manila Bay
CORREGIDOR I.
GUAM
SCALE OF MILES
Long. East from 145° Greenwich
Balintang Channel
BABUYANES IS.
C. Bojeador
C. Engaño
Lingayen Gulf
Dilasac Bay
Casiguran
Baler Bay
Bongabon
POLILLO I.
Lamon Bay
San Miguel Bay
Lagonoy Gulf
San Bernardino Str.
Albay
Sorsogon
BURIAS I.
ROMBLON I.
TICAO I.
Mindoro Strait
CALAMIANES IS.
CUYOS IS.
DUMARAN I.
GUIMARAS I.
Mt. Malaspina
CAGAYANES IS.
Puerto Princesa
Victoria Pk.
Balabac Str.
BALABAC I.
S. MIGUEL IS.
CAGAYAN I.
BOUNDARY OF U.S. POSSESSIONS
JOLO (SULU) ARCHIPELAGO
TAWI TAWI
SIBUTU I.
Basilan Str.
BASILAN I.
Zamboanga
Illana Bay
Cotabato
Davao (Verara)
Mt. Apo
Mt. Malindang
L. Malanao
L. Buluan
Sarangani Bay
Pt. Tinaca
SARANGANI IS.
C. S. Augustin
Pt. Sungi
Pt. Cauit
SIARGAO I.
DINAGAT I.
Surigao Str.
Butuan Bay
Agusan R.
Cagayan R.
Iligan
Misamis
Dapitan
Tagbilaran
Dumaguete
Tolon
SIQUIJOR I.
CAMIGUIN I.
Iloilo
Capiz
Romblon
Mt. Halcon
Mt. Mayon
Taal
Batangas
Balayan
Lubang
Golo I.
Passage
Cook
Tayabas
Lamon B.
Daet
Pacific
Malolos
Bulacan
Subic
Bacolor
Iba
Lingayen
Dagupan
Gulf of Lingayen
Vigan
Laoag
Aparri
Tuguegarao
Cagayan R.
Bolinao
Sual
Orion
Balanga
Mariveles
Cavite
Fort
Bay
Pampanga R.
Pasig R.
Pulo R.
Bataan
Tinkio B.
Sta. Rosa Pk.
S. Luis d'Apra Harbor
Agaña
Pago
Merizo
Tigbao
Carbalogan
Catbalogan
Tacloban
Ormoc
Carigara
Leyte
Cebu
Bohol
Negros
Panay
Guimaras
Malalison
Romblon
Masbate
Ticao
Sorsogon
Albay
Lagonoy Gulf
San Miguel Bay

white race live in Manila, Iloilo and other towns. Nearly all the large towns are on the seacoast.

Manila. Manila, having a population of about 220,000, is the capital and largest city of the archipelago. It is situated on a fine bay, at the mouth of the Pasig river, the outlet of Bay lake. The older part of the city is on the south bank of this river; the newer part is on the north side. The modern buildings are mostly low and built of wood, as they withstand earthquake shocks much better than high stone structures. The greater part of the foreign trade of the islands passes through Manila.

The second port in importance is **Iloilo,** on the island of Panay. In exchange for hemp, tobacco and sugar, the islands import mainly rice, flour, cloth, coal and kerosene. The foreign trade amounts yearly to about $30,000,000 — one sixth being with the United States. A large part of the trade is carried on with Great Britain.

Filipinos (Philippine Natives) and Buffalo or Carabao.

GUAM. Almost due east of Manila, about 1600 miles out in the Pacific, rises the island of Guam. It is the southernmost of a chain of islands stretching northward for about 500 miles (*see inset on map of Philippines; also full-page map of Australia, Micronesia,* etc.). Magellan named these the *Ladrones,* or *thieves'* islands, because the natives stole some of his goods. The islands are small and mostly volcanic, some having active craters. The climate resembles that of Hawaii. The total area is only 420 square miles, with a population of 10,000. Most of the people live on the island of Guam — fully half of them being in the capital town of **Agana.** At the close of the recent war with Spain, Guam was ceded to the United States.

TUTUILA AND MANUA ISLANDS. These islands belong to a group known as the *Samoa islands.* They are far out in the Pacific, east of Australia (*see map on page 187*).

Tutuila and the Manua group belong to the United States. Their best harbor is **Pago Pago,** on Tutuila. It will be used as a coaling station. Tutuila is rugged with mountains, but there are dense forests and fertile valleys. The people belong to the white race.

WAKE ISLAND. Far to the northeast of Guam lies the small coral island known as *Wake island.* It belongs to the United States, but nobody lives on it.

VIRGIN ISLANDS. This group of small islands lies east of Porto Rico. Vieques, Culebra and a few smaller rocky islands belong to the United States (*see map on page 2*). The Senate of this country has approved a treaty for the purchase of St. Thomas, St. Croix (or Santa Cruz) and St. John, from Denmark.

Sugar is the principal product of these islands. The chief port is **Charlotte Amalie,** on St. Thomas. It has a deep and safe harbor.

Pronouncing Word List.

Key: āle, ăt, ärm, fin*a*l; ēve, ĕnd; īce, ĭll; ōld, ŏn; ūse, ŭp; fo͝od; ch *as in* chop; g *as in* go; th *as in* thin; ow *as in* cow.

Agana, ä-gän′yä.
Aguadilla, ä-gwä-dē′yä.
Antilles, ăn-tĭl′lēz.
Arecibo, ä-rä-sē′bō.

Balanga, bä-läng′gä.
Baracoa, bä-rä-kō′ä.
Batabano, bä-tä-bä-nō′.
Bay, bī.
Bayamon, bä-yä-mōn′.
Bohol, bō-ōl′.
Bulacan, bo͞o-lä-kän′.

Caimanera, kī-mä-nä′rä.
Cardenas, kär′dä-näs.
Cavite, kä-vē′tä.
Cebu, sē-bo͞o′.
Charlotte Amalie, shär′lŏt ä-mä′lē-ę.
Cienfuegos, sē-ĕn-fwā′gōs.
Corrientes, kŏr-rē-ĕn′tēs.

Culebra, ko͞o-lā′brä.

Filipino, fĭl-ĭ-pē′nō.

Guam, gwäm.
Guanabacoa, gwä-nä-bä-cō′ä.
Guantanamo, gwän-tä′nä-mō.
Guayama, gwī-ä′mä.

Hawaii, hä-wī′ē.
Hilo, hē′lō.
Holguin, ōl-gēn′.
Honolulu, hō-nō-lo͞o′lo͞o.

Iloilo, ē-lō-ē′lō.
Isla de Pinos, ēs′lä dā pē′nōs.
Isla de Vieques, ēs′lä dā vē-ā′kās.

Jolo, hō-lō′.
Jucaro, ho͞o′kä-rō.

Kahoolawe, kä-hō-ō-lä′vā.
Kauai, kow-ī′ē.
Kealakekua, kā-ä-lä-kā-ko͞o′ä.
Kilauea, kē-low-ā′ä.

Ladrones, la-drōn′ās.
Lanai, lä-nā′ē.
Leyte, lā′ē-tā.
Luzon, lo͞o-zŏn′.

Maestra, mä-ās′trä.
Manila, ma-nĭl′a.
Manua, mä′no͞o-ä.
Masbate, mäs-bä′tä.
Matanzas, ma-tän′sas.
Maui, mow′ē.
Mauna Kea, mow′nä kā′ä.
Mauna Loa, mow′nä lō′ä.
Mayaguez, mī-ä-gwĕs′.
Maysi, mī-sē′.
Mindanao, mēn-dä-nä′ō.
Mindoro, mēn-dō′rō.
Molokai, mō-lō-kī′.

Negrito, nē-grī′tō.
Negros, nā′grōs.
Niihau, nē-how′.
Nuevitas, nwā-vē′täs.

Oahu, ō-ä′ho͞o.

Pago, pä′gō.
Palawan, pä-lä′wän.
Pampanga, päm-pän′gä.
Panay, pä-nī′.
Pasig, pä-sēg′.
Philippine, fĭl′ĭp-ĭn.
Pinar del Rio, pē-när′ dĕl rē′ō.
Ponce, pōn′sā.
Porto Rico, pōr′tō rē′kō.
Puerto Principe, pwĕr′to prēn′sē-pā.

Rio Cauto, rē′ō kow′tō.

Sagua la Grande, sä′gwä lä grän′dä.
St. Croix, croy.
Samar, sä-mär′.
Sancti Spiritus, sänk′tĭ spĭr′ĭ-to͞os.
San German, sän hĕr-män′.
San Juan, sän ho͞o-än′.
Santiago, sän-tē-ä′gō.
Subic, so͞o-bēk′.
Sulu, so͞o-lo͞o′.

Trocha, trō′chä.
Tutuila, to͞o-twē′lä.

NORTH POLE
Longitude West from Greenwich
ASIA
BERING SEA
ARCTIC OCEAN
GREENLAND
BAFFIN BAY
Davis Strait
Denmark Strait
ICELAND
ALASKA
Yukon
Mt. McKinley
Mt. St. Elias
Mt. Fairweather
Mt. Logan
Mt. Wrangell
Bering Str.
Bristol Bay
ALASKA PENINSULA
Cook Inlet
Kodiak I.
Shumagin
Pribilof Is.
St. George
St. Lawrence I.
St. Michael
Norton Sound
Pt. Barrow
Icy Cape
East Cape
Wrangell I.
Herald I.
Manning Pt.
Banks Str.
Prince of Wales
Kotzebue Sd.
Kuskokwim R.
Yukon R.
Koyukuk R.
Tanana R.
Fairbanks
Dawson
KLONDIKE
Mackenzie R.
Great Bear L.
Great Slave L.
Peace R.
Athabaska R.
Lake Athabaska
Lake Winnipeg
Lake Winnipegosis
Lake Manitoba
Lake of the Woods
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Lake Nipigon
Lake Seul
Lake Albany
Lake Abitibi
Lake Mistassini
Lake Nueltin
Lake Wollaston
Reindeer L.
Great Slave L.
Great Bear L.
Great Fish R.
Hayes R.
Churchill R.
Nelson R.
Severn R.
Winnipeg R.
Saskatchewan R.
Red R.
Assiniboine R.
Missouri R.
Yellowstone R.
Columbia R.
Fraser R.
Peace R.
Liard R.
Mackenzie R.
Ottawa R.
St. Lawrence R.
Hudson Strait
Hudson Bay
James Bay
Foxe Channel
Fox Land
Baffin Land
Melville Peninsula
Cumberland Sound
Frobisher Bay
Resolution I.
C. Chidley
C. Wolstenholme
C. Southampton
C. Henrietta Maria
C. Harrietta Maria
Gt. Whale R.
Ft. York
Ft. Albany
Ft. Chippewyan
Ft. Simpson
Ft. Yukon
Ft. Selkirk
Ft. Liard
Ft. Rae
Ft. Resolution
Ft. Norman
Ft. Good Hope
Ft. McPherson
Ft. Macleod
Ft. Assiniboine
Ft. Garry
Ft. Pelly
Ft. Nelson
Ft. Vermilion
Ft. Dunvegan
Ft. Providence
Ft. Wrangell
Ft. Simpson
Ft. Rupert
Ft. St. John
Ft. Laramie
Ft. Benton
Ft. Union
Ft. Leavenworth
Ft. Riley
Ft. Gibson
Ft. Smith
Ft. Worth
Ft. Sill
Ft. Bliss
Ft. Yuma
Ft. Tejon
Ft. Crook
Ft. Hall
Ft. Boise
Ft. Walla Walla
Ft. Vancouver
Ft. Colville
Ft. Kamloops
Ft. Alexandria
Ft. Garry
Ft. Pembina
Ft. Abercrombie
Ft. Ridgely
Ft. Snelling
Ft. Dodge
Ft. Des Moines
Ft. Madison

UNITED STATES

SCALE OF MILES 0 50 100 200 300 400

ALASKA

SCALE OF MILES 0 50 100 200 300 400

MIDDLE ATLANTIC STATES
SCALE OF MILES
0 10 20 30 40 50 60 70 80 90 100
DOMINION OF CANADA
The Great Lakes
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
MEXICO
GULF OF MEXICO
Rio Grande
Mississippi R.
Missouri R.
LAKE ONTARIO
(Elev., 247 ft. above Sea Level)
LAKE ERIE
(Elev., 573 ft. above Sea Level)
PT. PELEE I.
L. Simcoe
L. Rideau
Thousand Islands
Lake Champlain
Lake George
Lake Memphremagog
St. Lawrence R.
Rideau Canal
Welland Canal
Erie Canal
Champlain Canal
Chesapeake & Delaware Canal
Susquehanna R.
Delaware R.
Hudson R.
Mohawk R.
Genesee R.
Niagara R.
Niagara Falls
Allegheny R.
Monongahela R.
Ohio R.
Kanawha R.
Potomac R.
Rappahannock R.
James R.
York R.
Chesapeake Bay
Delaware Bay
Atlantic City
Cape May
Cape Henlopen
Barnegat Inlet
Absecon Inlet
Ocean Grove
Long Branch
Asbury Park
Toms River
Tuckerton
Ocean City
Rehoboth
Snow Hill
Pocomoke
Accomac
Eastville
Charles
Yorktown
Norfolk
Portsmouth
Berkley
Suffolk
Newport News
Hampton Roads
Fortress Monroe
C. Charles
C. Henry
Dismal Swamp
Great Bridge
Currituck Sd.
Albemarle Sd.
Roanoke R.
Weldon
Gaston
Boydton
Clarksville
Danville
Martinsville
Hillsville
Independence
Bristol
White Top
Abingdon
Marion
Saltville
Lebanon
Tazewell
Pulaski
Wytheville
Clintwood
Grundy
Pocahontas
Keystone
Peorysville
Princeton
Bramwell
Bluefield
Graham
Pearisburg
Blacksburg
New River Depot
Christiansburg
Rocky Mount
Floyd
Elba
Lunenburg
Smithfield
Franklin
Houston
Chatham
S. Boston
N. Danville
Stuart
Meherrin R.
Nottoway R.
Appomattox
Farmville
Rustburg
Pamplin
Crewe
Burkeville
Blackstone
Dinwiddie
Petersburg
City Point
Manchester
RICHMOND
West Point
Williamsburg
Eastville
Charles
Yorktown
Fort Monroe
Hampton Roads
Norfolk
Portsmouth
Berkley
Suffolk
Newport News
Smithfield
Lynchburg
Bedford
Roanoke
Salem
Vinton
Peaks of Otter
Natural Bridge
Buchanan
Finnastle
Amherst
Buckingham
Cumberland
Amelia
Manchester
Goochland
Ashland
Barton Heights
Scottsville
Charlottesville
Louisa
Orange
Gordonsville
Fredericksburg
Rappahannock R.
Rapidan R.
Culpeper
Warrenton
Manassas
Alexandria
Fairfax
Falls Church
Georgetown
Front Royal
Woodstock
Strasburg
Middletown
Berryville
Winchester
Shenandoah
Harrisonburg
Broadway
Luray
Newmarket
Staunton
Basic City
University of Virginia
Waynesboro
Warm Springs
Fayetteville
Ansted
Montgomery
Madison
Coalburg
Kanawha Cy.
CHARLESTON
Gauley
Greenbrier R.
Greenbrier Wte.
Huntersville
Webster Springs
Sutton
Elkins
Beverly
Franklin
Moorefield
Romney
Charles Town
Harpers Ferry
Shepherdstown
Martinsburg
Pawpaw
Hagerstown
Williamsport
Sharpsburg
Frederick
Brunswick
Catoctin Mts.
Blue Ridge Mts.
Allegheny Mts.
Cumberland
Frostburg
Lonaconing
Westernport
Keyser
Piedmont
Oakland
Kingwood
Morgantown
Fairmont
Mannington
New Martinsville
Moundsville
Wheeling
Benwood
Wellsburg
Steubenville
Cumberland
Fairview
Sewickley
Millvale
Pittsburgh
Allegheny
Mc Kees Rocks
Carnegie
Homestead
Duquesne
McKeesport
Braddock
Turtle Creek
Wilkinsburg
Edgewood
Swissvale
Penn
Wilmerding
Turtle Creek
Monongahela
Elizabeth
Greensburg
Jeannette
Irwin
Latrobe
Mt. Pleasant
Scottdale
Connellsville
Uniontown
Somerset
Bedford
Chambersburg
Meyersdale
Berlin
Hancock
Waynesboro
Gettysburg
Hanover
York
Carlisle
Mechanicsburg
Shippensburg
Mt. Union
Huntingdon
Hollidaysburg
Altoona
Tyrone
Lewistown
Mifflintown
Juniata R.
Ebensburg
Johnstown
Blairsville
Saltsburg
Apollo
Indiana
Kittanning
Punxsutawney
Butler
New Brighton
Beaver Falls
Beaver
Rochester
Tarentum
Harmarville
Millvale
Sharpsburg
Aspinwall
Oil City
Franklin
Titusville
Meadville
Conneautville
Corry
Union City
Warren
Sheffield
Kane
Wilcox
Johnsonburg
Ridgway
St. Marys
Emporium
Renovo
Dubois
Brookville
Reynoldsville
Clearfield
Punxsutawney
Newcastle
Sharon
Mercer
Greenville
Sandusky
Cleveland
Bradford
Oswayo
Coudersport
Knoxville
Wellsboro
Antrim
Blossburg
Tioga
Athens
Sayre
Great Bend
Susquehanna
Troy
Towanda
Montrose
Canton
Barclay
Forest City
Carbondale
Olyphant
Dickson
Tunkhannock
Exeter
Old Forge
Pittston
Avoca
Scranton
Dunmore
Archbold
Wilkesbarre
Edwardsdale
Plymouth
Ashley
Nanticoke
Freeland
Hazleton
Lansford
Mauch Chunk
Bethlehem
Easton
Phillipsburg
Lehighton
Catasauqua
Allentown
Quakertown
Pottsville
Minersville
Shenandoah
Mt. Carmel
Shamokin
Ashland
St. Clair
Schuylkill Haven
Reading
Lebanon
Steelton
Middletown
Phoenixville
Norristown
Bristol
Doylestown
Pottstown
Lancaster
Coatesville
West Chester
Conshohocken
Philadelphia
Camden
Gloucester
Woodbury
Barnegat
Tuckerton
Millville
Bridgeton
Salem
Middletown
Delaware
Elmer
Vineland
Maya Landing
Atlantic City
Absecon Inlet
Cape May
Cape Henlopen
Lewes
Rehoboth
Milton
Georgetown
Harrington
Bay
Milford
DOVER
Delaware
Centerville
Easton
St. Michaels
Oxford
Cambridge
E. New Market
Seaford
Laurel
Delmar
Salisbury
Princess Anne
Pocomoke
Snow Hill
Berlin
Crisfield
Deal Island
Tangier Sd.
Pocomoke Sd.
Tappahannock
Hanover
Ashland
Goochland
Lovingston
Buena Vista
Natural Bridge
Lexington
Clifton Forge
White Sulphur Spgs.
Lowmoor
Covington
Hinton
Union
Lewisburg
Ronceverte
Beckley
Logan
Gauley
Greenbrier R.
Kanawha R.
Elk R.
Coal R.
New R.
Gauley R.
Big Sandy R.
Tug Fork
Levisa Fk.
Guyandot R.
Huntington
Ohio R.
Point Pleasant
Gallipolis
Ripley
Spencer
Ravenswood
Newhaven
Clifton
Mason
Parkersburg
Marietta
St. Marys
Pennsboro
Grafton
Fetterman
Rowlesburg
Newburg
Monongah
Kingwood
Morgantown
Fairmont
Mannington
Clarksburg
Salem
W. Union
Weston
Philippi
Buckhannon
Glenville
Burning Spgs.
Elizabeth
Belpre
Williamstown
Vienna
Parkersburg
Marietta
Ohio R.
Kanawha R.
Elk R.
Gauley R.
Greenbrier R.
New R.
Big Sandy R.
Tug Fork
Levisa Fk.
Guyandot R.
Huntington
Ohio R.
Point Pleasant
Gallipolis
Ripley
Spencer
Ravenswood
Newhaven
Clifton
Mason
Parkersburg
Marietta
St. Marys
Pennsboro
Grafton
Fetterman
Rowlesburg
Newburg
Monongah
Kingwood
Morgantown
Fairmont
Mannington
Clarksburg
Salem
W. Union
Weston
Philippi
Buckhannon
Glenville
Burning Spgs.
Elizabeth
Belpre
Williamstown
Vienna

NEW ENGLAND STATES
SCALE OF MILES
0 10 20 30 40 50 60 70 80
BOSTON AND VICINITY
SCALE OF MILES
0 1 2 3 4 5 6
DOMINION OF CANADA
UNITED STATES
The Great Lakes
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
Rio Grande
Mississippi R.
Missouri R.
QUEBEC
St. Lawrence R.
GULF OF ST. LAWRENCE
Arthabaskaville
Richmond
St. Hyacinthe
Montreal
Sherbrooke
St. Johns
L. Megantic
Lake Memphremagog
Jesus I.
Richelieu R.
St. Francis R.
Yamaska R.
St. Peter L.
St. Peter R.
Chaudiere R.
Kennebec R.
Dead R.
Moosehead L.
Penobscot R.
Mattawamkeag R.
St. Croix R.
Calais
Milltown
St. John R.
FREDERICTON
Woodstock
Houlton
Island Falls
Hodgdon
Linneus
Patten
Mt. Katahdin
Chesuncook L.
Haynesville
Schoodic Lakes
Danforth
Vanceboro
Passadumkeag
Dexter
Atkinson
Corinth
Sangerville
Dover
Foxcroft
Guilford
Blanchard
Monson
Sebec L.
Greenville
Lincoln
Brownville
Milo
Oldtown
Orono
Bangor
Brewer
Orrington
Amherst
Whitneyville
Machias
E. Machias
Machiasport
Cherryfield
Harrington
Columbia
Addison
Jonesport
Machias Bay
SEAL IS.
GRAND MANAN I.
Pembroke
Perry
Eastport
Lubec
CAMPOBELLO
Passamaquoddy B.
Milbridge
Franklin
Sullivan
Gouldsboro
Frenchman Bay
Bar Harbor
MT. DESERT I.
Pleasant Bay
Blue Hill
Brooksville
Eden
Ellsworth
Bucksport
Orland
Frankfort
Winterport
Hampden
Winslow
China
Dixmont
Belfast
Searsport
Penobscot Bay
Castine
Belmont
Islesboro
Isle au Haut
Vinalhaven
Rockland
Rockport
Camden
Lincolnville
Thomaston
St. George
Warren
Waldoboro
Wiscasset
Bristol
Boothbay
Boothbay Harbor
Damariscotta
Newcastle
Bath
Topsham
Brunswick
Lisbon
Gardiner
Richmond
Dresden
Hallowell
Chelsea
Augusta
Winthrop
Monmouth
Litchfield
Farmingdale
Pittston
Waterville
Fairfield
Skowhegan
Norridgewock
Madison
Anson
Strong
Phillips
Saddleback Mt.
Mooselookmeguntic L.
Rangeley
Rangeley L.
Rangeley Lakes
Kingfield
Carrabassett R.
Dead R.
Kennebec R.
Sandy R.
Dixfield
Jay
Livermore Falls
Oakland
Canton
Peru
Turner
Auburn
Lewiston
Mechanic Falls
Poland
Norway
Paris
Bethel
Gilead
Andover
Rumford
Wilton
Farmington
Temple
Jerusalem
Umbagog L.
Androscoggin R.
Androscoggin L.
Errol
Dixville
Berlin Falls
Berlin
Gorham
Shelburne
Jefferson
Lancaster
Whitefield
Littleton
Concord
Stratford
Northumberland
Milan
Stewartstown
Colebrook
Newport
Derby
Island Pond
Barton
Columbia
Albany
Brownington
Craftsbury
Morristown
Hardwick
Greensboro
Glover
Barnet
Danville
St. Johnsbury
Lyndonville
Burke
Sutton
Newark
Ryegate
Wells River
Groton
Peacham
Topsham
Corinth
Bradford
Newbury
Haverhill
Woodsville
Lisbon
Littleton
Franconia
Bethlehem
Mt. Washington
Mt. Adams
Mt. Jefferson
Mt. Clay
Mt. Lafayette
Mt. Garfield
Mt. Cabot
Mt. Mansfield
Camels Hump
Lake Champlain
Lake George
Adirondack Mts.
Plattsburg
Burlington
Winooski
Essex
Milton
Fairfax
Georgia
Swanton
Highgate
Franklin
Richford
Montgomery
Troy
Enosburg
St. Albans
Fairfield
Bakersfield
Fairfax
Johnson
Hyde Park
Cambridge
Underhill
Jericho
Richmond
Huntington
Hinesburg
Charlotte
Ferrisburg
Vergennes
Middlebury
Bristol
Starksboro
Waterbury
Stowe
Cabot
Marshfield
Barnet
Montpelier
Barre
Berlin
Williamstown
Northfield
Newbury
Woodsville
Bradford
Randolph
Brandon
Pittsford
Proctor
Rutland
W. Rutland
Killington Peak
Castleton
Shrewsbury
Poultney
Wallingford
Fair Haven
Whitehall
Hartford
Thetford
Orford
Lyme
Hanover
Canaan
Enfield
Lebanon
Plainfield
Windsor
Claremont
Franklin
Ludlow
Springfield
Newport
Dorset
Pawlet
Manchester
Arlington
Bellows Falls
Walpole
Westminster
Chester
Charlestown
Saratoga Spa
Shaftsbury
Glastonbury
Bennington
Brattleboro
Wilmington
Dummerston
Putney
Vernon
Hinsdale
Fowlnal
Keene
Marlboro
Peterboro
Winchester
Troy
Jaffrey
Greenville
Nashua
Hillsboro
Henniker
Hopkinton
Weare
Antrim
Hooksett
Pembroke
Concord
Allenstown
Pittsfield
Rochester
Somersworth
Dover
Newmarket
Exeter
Epping
Derry
Amesbury
Salisbury
Hampton
Seabrook
Newburyport
Ipswich
Rowley
Haverhill
Methuen
Lawrence
Andover
Lowell
Ayer
Woburn
Lynn
Salem
Marblehead
C. Ann
Gloucester
Peabody
Danvers
Lynnfield
Wakefield
Reading
Stoneham
Melrose
Malden
Medford
Somerville
Cambridge
Boston
Lexington
Winchester
Woburn
Arlington
Belmont
Waltham
Watertown
Newton
Brighton
Roxbury
Dorchester
Chelsea
Revere
Winthrop
Hull
Nantasket Beach
Hingham
Quincy
Weymouth
Braintree
Abington
Rockland
Whitman
Brockton
Stoughton
Milford
Franklin
Medway
Mansfield
Attleboro
Easton
Bridgewater
Taunton
Middleboro
Plymouth
Duxbury
Cohasset
Scituate
Marshfield
Pembroke
Hanover
Norwell
Hingham
Weymouth
Braintree
Quincy
Dedham
Needham
Wellesley
Natick
Framingham
Sudbury
Concord
Acton
Maynard
Stow
Hudson
Marlboro
Southborough
Northborough
Shrewsbury
Worcester
Millbury
Sutton
Auburn
Oxford
Webster
Dudley
Charlton
Southbridge
Sturbridge
Brookfield
Spencer
Leicester
Clinton
Lancaster
Harvard
Littleton
Groton
Pepperell
Ashby
Townsend
Shirley
Ayer
Devens
Fitchburg
Leominster
Gardner
Athol
Orange
Montague
Greenfield
Deerfield
Northfield
Bernardston
Erving
Wendell
Warwick
Orange
Petersham
Barre
Hubbardston
Templeton
Winchendon
Gardner
Westminster
Fitchburg
Leominster
Lunenburg
Ashburnham
Ashby
Pepperell
Townsend
Shirley
Ayer
Devens
Harvard
Littleton
Groton
Dunstable
Tyngsboro
Chelmsford
Billerica
Bedford
Lexington
Arlington
Belmont
Cambridge
Somerville
Medford
Malden
Melrose
Wakefield
Reading
Lynnfield
Peabody
Salem
Beverly
Manchester
Gloucester
Rockport
Essex
Ipswich
Hamilton
Wenham
Topsfield
Boxford
Georgetown
Rowley
Newbury
Newburyport
Amesbury
Salisbury
Seabrook
Hampton
Exeter
Newmarket
Durham
Lee
Madbury
Dover
Somersworth
Rochester
Farmington
Milton
Wolfeboro
Alton
Gilmanton
Barnstead
Pittsfield
Chichester
Loudon
Canterbury
Northfield
Tilton
Laconia
Meredith
Sanbornton
Belmont
Gilford
Center Harbor
Moultonborough
Sandwich
Tamworth
Ossipee
Effingham
Freedom
Wakefield
Brookfield
Wolfeboro
Alton
Milton
Farmington
Rochester
Somersworth
Berwick
South Berwick
Kittery
Eliot
Kittery Point
Portsmouth
Newington
Rye
New Castle
Isles of Shoals
Appledore I.
Star I.
Smuttynose I.
Hog I.
Duck I.
Cedar I.
Gosport
Portland
South Portland
Cape Elizabeth
Biddeford
Saco
Old Orchard
Scarborough
Pine Point
Saco R.
Kennebunk
Kennebunkport
Wells
Ogunquit
York
Cape Neddick
Sanford
Springvale
Alfred
Limerick
Waterboro
Lyman
Hollis
Buxton
Gorham
Westbrook
Deering
Windham
Gray
New Gloucester
Sebago L.
Long L.
Bridgton
Harrison
Naples
Casco
Raymond
Otisfield
Oxford
Norway
Paris
Hebron
Harpswell
Brunswick
Freeport
Yarmouth
Cumberland
Falmouth
Cape Elizabeth
Scarborough
Pine Point
Old Orchard
Saco
Biddeford
Kennebunkport
Kennebunk
Wells
Ogunquit
York
Cape Nedd

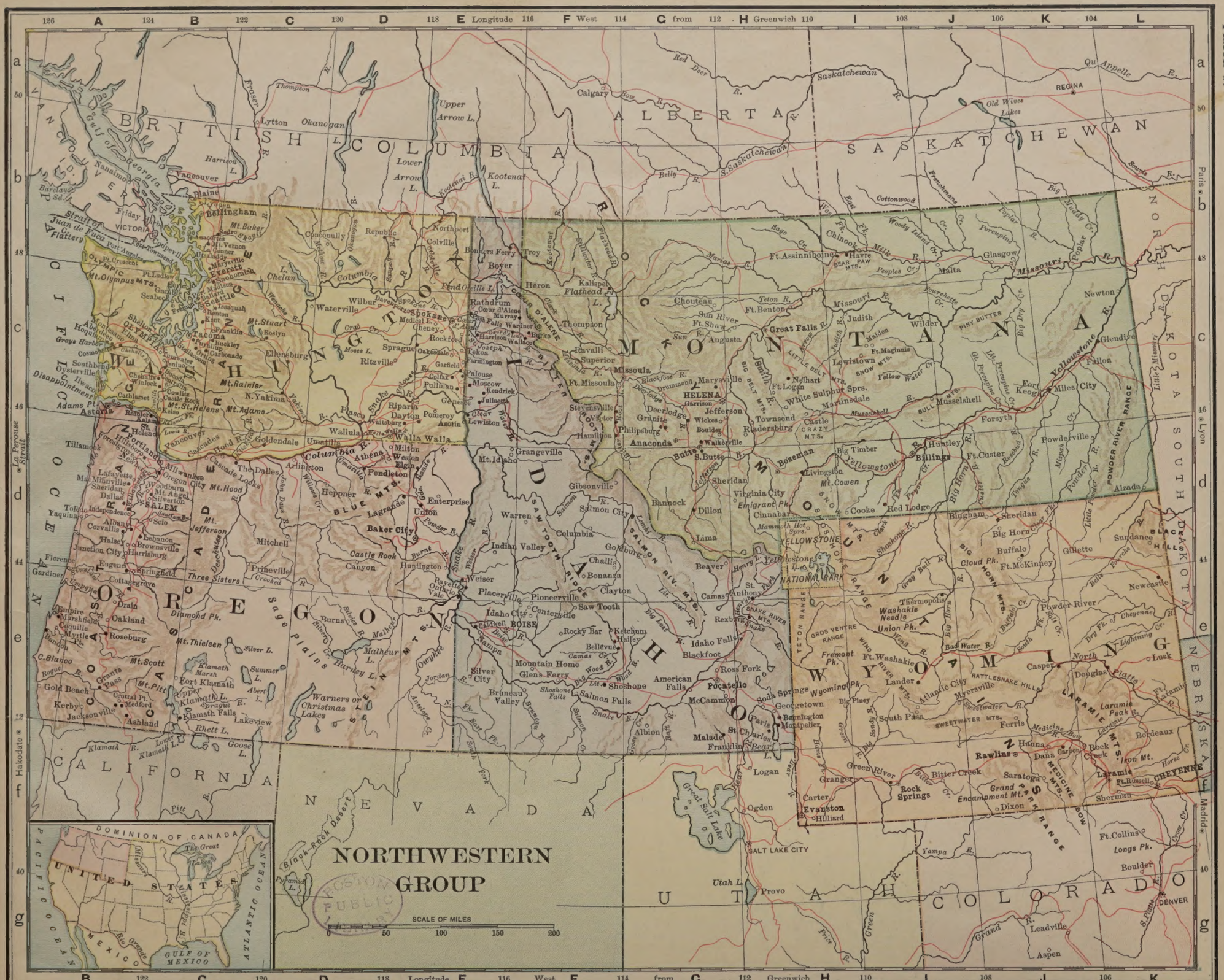
BOSTON PUBLIC LIBRARY

SOUTHERN STATES
WESTERN SECTION
SCALE OF MILES
0 50 100 150 200
COLORADO
KANSAS
MISSOURI
KY.
TENN.
MISSISSIPPI
NEW MEXICO
OKLAHOMA
ARKANSAS
LOUISIANA
TEXAS
GULF OF MEXICO
DOMINION OF CANADA
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
MEXICO
GULF OF MEXICO
Longitude West from Greenwich
Tokyo
Gibraltar
Shanghai
Morocco
Mt. Everest
Canary Islands
SANTA FE
GUTHRIE
OKLAHOMA
LITTLE ROCK
JACKSON
BATON ROUGE
AUSTIN
Houston
Galveston
Galveston Bay
Matagorda Bay
MATAGORDA I.
ST. JOSEPH I.
PADRE I.
Corpus Christi Bay
Aransas Pass
Velasco
Sabine Pass
Sabine L.
Calcasieu L.
Mermentau R.
White L.
Atchafalaya Bay
Timbalier B.
Barataria Bay
Delta of the Mississippi
New Orleans
Lake Charles
Beaumont
Port Arthur
Galveston
Corpus Christi
Brownsville
Laredo
El Paso
Fort Worth
Dallas
Waco
Shreveport
Texarkana
Little Rock
Hot Springs
Fort Smith
Memphis
Vicksburg
Natchez
Meridian
Tulsa
Oklahoma
Wichita Falls
Amarillo
Lubbock
Abilene
San Angelo
Midland
Odessa
Pecos
Sierra Blanca
Ft. Davis
Marfa
Presidio
Presidio del Norte
Presidio de San Vicente
Eagle Pass
Del Rio
Uvalde
San Antonio
New Braunfels
San Marcos
Austin
Waco
Temple
Bryan
College Station
Huntsville
Conroe
Houston
Galveston
Beaumont
Port Arthur
Lake Charles
Lafayette
New Iberia
Baton Rouge
New Orleans
Shreveport
Texarkana
Tyler
Longview
Marshall
Jefferson
Paris
Denison
Sherman
Gainesville
Wichita Falls
Vernon
Quanah
Childress
Clarendon
Pampa
Borger
Perryton
Dalhart
Guymon
Hooker
Kenton
Boise City
Liberal
Elkhart
Clayton
Raton
Las Vegas
Santa Fe
Albuquerque
Gallup
Grants
Socorro
Las Cruces
El Paso
Carlsbad
Roswell
Artesia
Hobbs
Lovington
Tatum
Clovis
Portales
Tucumcari
Logan
Springer
Trinidad
Pueblo
Colorado Springs
Denver
Cheyenne
Laramie
Rawlins
Rock Springs
Green River
Evanston
Salt Lake City
Ogden
Provo
Price
Vernal
Grand Junction
Montrose
Durango
Cortez
Farmington
Aztec
Bloomfield
Shiprock
Kayenta
Tuba City
Flagstaff
Winslow
Holbrook
Show Low
Globe
Miami
Superior
Casa Grande
Phoenix
Mesa
Tempe
Scottsdale
Glendale
Peoria
Buckeye
Gila Bend
Ajo
Yuma
San Luis
Somerton
Gadsden
Nogales
Douglas
Bisbee
Tombstone
Benson
Willcox
Safford
Clifton
Morenci
Duncan
Lordsburg
Deming
Silver City
Hurley
Santa Rita
Tyrone
Hachita
Columbus
Rodeo
Animas
Hatch
Las Cruces
Anthony
Sunland Park
Canutillo
Fabens
Tornillo
Clint
Socorro
Belen
Los Lunas
Bernalillo
Albuquerque
Rio Rancho
Corrales
Placitas
Cuba
Jemez Springs
Bernalillo
Santa Fe
Pojoaque
Espanola
Chama
Dulce
Ignacio
Bayfield
Durango
Pagosa Springs
Monte Vista
Alamosa
Saguache
Gunnison
Crested Butte
Montrose
Ouray
Telluride
Ridgway
Delta
Grand Junction
Fruita
Loma
Mack
Dove Creek
Cortez
Mancos
Dolores
Rico
Norwood
Nucla
Naturita
Paradox
La Sal
Moab
Monticello
Blanding
Bluff
Mexican Hat
Kayenta
Monument Valley
Tuba City
Cameron
Grand Canyon
Williams
Flagstaff
Winslow
Holbrook
Show Low
Pinetop
Lakeside
Snowflake
Taylor
Heber
Payson
Pine
Strawberry
Star Valley
Young
Globe
Miami
Superior
Kearny
Hayden
Winkelman
Florence
Coolidge
Casa Grande
Eloy
Maricopa
Stanfield
Arizona City
Casa Grande
Phoenix
Tempe
Mesa
Chandler
Gilbert
Queen Creek
Apache Junction
Scottsdale
Fountain Hills
Carefree
Cave Creek
New River
Anthem
Peoria
Glendale
Sun City
Surprise
Litchfield Park
Goodyear
Buckeye
Tonopah
Arlington
Gila Bend
Ajo
Why
Lukeville
Sonoyta
Yuma
Somerton
San Luis
Gadsden

PLATE H.

BOSTON PUBLIC LIBRARY

CENTRAL STATES
EASTERN SECTION
SCALE OF MILES
0 20 40 60 80 100 120
Longitude West from Greenwich
93 91 89 87 85 83 81
A B C D E F
a b c d e f g
Hakodate Portland Peking San Francisco Lisbon Madrid Marseille Lyon
LAKE SUPERIOR
LAKE MICHIGAN
LAKE ERIE
LAKE ONTARIO
Elev., 602 ft. above Sea Level
Elev., 581 ft. above Sea Level
Elev., 573 ft. above Sea Level
Elev., 334 ft. above Sea Level
DOMINION OF CANADA
UNITED STATES
MEXICO
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
ISLE ROYAL
MICHIPICOTEN I.
CARIBOU I.
APOSTLES IDS.
MANITOU I.
MANITOULIN I.
BOIS BLANC I.
WASHINGTON I.
BEAVER I.
N. MANITOU I.
S. MANITOU I.
WISCONSIN
MICHIGAN
MINNESOTA
IOWA
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
VIRGINIA
TENNESSEE
MISSOURI
PENNSYLVANIA
N.CAR.
S.CAR.
Keweenaw Bay
Keweenaw Pt.
Pt. aux Baies
Grand Marais
Pt. au Sable
Whitefish Pt.
Whitefish Bay
Grand Traverse Bay
Green Bay
Saginaw Bay
Georgian Bay
North Channel
Lake Huron
Lake Michigan
Lake Erie
Lake Ontario
Lake St. Clair
St. Clair R.
Detroit R.
Niagara R.
Thunder Bay
Pt. Au Sable
Pt. aux Barques
Pt. Pelee I.
Duluth
Superior
Ashland
Houghton
Hancock
L'Anse
Marquette
Munising
Sault Ste. Marie
St. Ignace
Mackinac
Cheboygan
Alpena
Rogers
Petoskey
Harbor Spgs.
Charlevoix
E. Jordan
Gaylord
Central Lake
Bellaire
Mancelona
Kalkaska
Otsego Lake
Harrisville
Traverse City
Frankfort
Grayling
Oscoda
Au Sable
East Tawas
Tawas
Omer
West Branch
L. Houghton
Cadillac
Manistee
Ludington
Evart
Reed City
Pentwater
Clare
W. Bay City
Midland
Essexville
Bay City
Cass City
Sebewaing
Port Austin
Harbor Beach
Port Huron
Marine City
St. Clair
Sarnia
London
St. Thomas
Goderich
Southampton
Owosso
Corunna
Durand
Perry
Holly
Rochester
Romeo
Pontiac
Mt. Clemens
Detroit
Windsor
Chatham
Leslie
Ann Arbor
Ypsilanti
Wyandotte
Monroe
Toledo
Put-in-Bay
Port Clinton
Sandusky
Cleveland
Lorain
Elyria
Lakewood
Euclid
Painesville
Conneaut
Geneva
Ashtabula
Fairport
Grand Haven
Muskegon
Whitehall
Shelby
Hart
Big Rapids
Fremont
Newaygo
Howard
Stanton
Greenville
Muskegon Heights
Holland
Saugatuck
South Haven
Bangor
Benton Harbor
Hartford
Paw Paw
Decatur
Three Rivers
Constantine
Dowagiac
Niles
Buchanan
Sturgis
Hillsdale
Hudson
Blissfield
Adrian
Tecumseh
Saline
Ypsilanti
Chelsea
Dexter
Manchester
Milan
Monroe
Grand Rapids
Ionia
St. Johns
Portland
Owosso
Corunna
Durand
Perry
Holly
Fenton
Grand Ledge
Eaton Rapids
Mason
Howell
Northville
Plymouth
Wayne
Dearborn
Ecorse
Grosse Pointe
Mt. Morris
Flint
Lapeer
Imlay City
Lexington
Port Sanilac
Yale
Marysville
Port Huron
Marine City
St. Clair
Sarnia
London
St. Thomas
Goderich
Southampton
Owen Sound
Collingwood
Meaford
Thornbury
Clarksburg
Wiarton
Tobermory
Cabot Head
Lion's Head
Bruce Mines
Little Current
Manitoulin I.
Cockburn I.
Killarney
Parry Sound
Byng Inlet
Pt. au Baril
Key Harbour
Shawanaga
Pt. au Mine
Pt. Au Baril
Pt. Au Mine
Pt. Detour
Drummond I.
Sugar Island
Whitefish Pt.
Whitefish Bay
Grand Marais
Pictured Rocks
Munising
Newberry
Sault Ste. Marie
St. Joseph
Mackinac
Mackinaw City
Cheboygan
Harbor Spgs.
Petoskey
Charlevoix
E. Jordan
Gaylord
Central Lake
Bellaire
Mancelona
Kalkaska
Otsego Lake
Harrisville
Traverse City
Frankfort
Grayling
Oscoda
Au Sable
East Tawas
Tawas
Omer
West Branch
L. Houghton
Cadillac
Manistee
Ludington
Evart
Reed City
Pentwater
Clare
W. Bay City
Midland
Essexville
Bay City
Cass City
Sebewaing
Port Austin
Harbor Beach


NORTHWESTERN GROUP
SCALE OF MILES
0 50 100 150 200
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
WASHINGTON
OREGON
IDAHO
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
COLORADO
UTAH
NEVADA
CALIFORNIA
DOMINION OF CANADA
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
Longitude West from Greenwich
PLATE J.

SOUTHWESTERN GROUP
SCALE OF MILES
0 50 100 150 200
Longitude from Greenwich
124 122 120 118 116 114 112 110 108 106 104 102
West
OREGON
IDAHO
NEBRASKA
WYOMING
NEVADA
UTAH
COLORADO
KANSAS
CALIFORNIA
ARIZONA
NEW MEXICO
OKLA.
TEXAS
Pacific Ocean
Gulf of California
Lower California
Mexico
Gulf of Mexico
Atlantic Ocean
Dominion of Canada
United States
SAN FRANCISCO AND VICINITY
SCALE OF MILES
SAN FRANCISCO
ALAMEDA
SANTA CLARA
CONTRA COSTA
Salt Lake City
Denver
Colorado Springs
Pueblo
Santa Fe
Albuquerque
Las Vegas
Phœnix
Tucson
Yuma
San Diego
Los Angeles
San Francisco
Sacramento
Reno
Carson City
Virginia City
Oakland
Stockton
Fresno
Bakersfield
San Jose
Monterey
Santa Barbara
Pasadena
San Bernardino
Riverside
Long Beach
Santa Monica
Pt. Conception
Pt. Loma
Coronado Is.
Santa Barbara Is.
San Clemente I.
San Miguel I.
Santa Rosa I.
Santa Cruz I.
Santa Catalina I.
San Nicolas I.
Anacapa I.
Death Valley
Mohave Desert
Colorado Desert
Great Salt Lake
Great American Desert
Sierra Nevada Mts.
Coast Ranges
Rocky Mts.
Wasatch Mts.
Uinta Mts.
Colorado R.
Rio Grande
Snake R.
Columbia R.
Sacramento R.
San Joaquin R.
Mississippi R.
Missouri R.
Arkansas R.
Pecos R.
Gila R.
Yuma
Tucson
Phœnix
Albuquerque
Santa Fe
Las Vegas
Denver
Colorado Springs
Pueblo
Salt Lake City
Ogden
Provo
Reno
Carson City
Virginia City
Sacramento
San Francisco
Oakland
Alameda
Berkeley
San Jose
Stockton
Fresno
Bakersfield
Monterey
Santa Barbara
Pasadena
Los Angeles
San Bernardino
Riverside
Long Beach
Santa Monica
San Diego

PUBLIC LIBRARY

SOUTH AMERICA
SCALE OF MILES
0 100 200 300 400 500 600 700 800
Comparative Area
400 MILES
200 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
PANAMA
SCALE OF MILES
0 5 10 15
Railroad
Proposed Canal
CARIBBEAN SEA
PACIFIC OCEAN
ATLANTIC OCEAN
COLOMBIA
VENEZUELA
ECUADOR
PERU
BOLIVIA
BRAZIL
PARAGUAY
CHILE
URUGUAY
ARGENTINA
BARBADOS
CURAÇAO
TOBAGO
TRINIDAD
GEORGETOWN
PARAMARIBO
CAYENNE
CARACAS
BOGOTA
LIMA
SUCRE
ASUNCION
MONTEVIDEO
BUENOS AIRES
SANTIAGO
RIO DE JANEIRO
GALAPAGOS IS. (To Ecuador)
FALKLAND ISLANDS (To Great Britain)
SOUTH GEORGIA (To Great Britain)
EQUATOR
TROPIC OF CAPRICORN
ANDES
AMAZON
PARANA
Panama
Colon
Chagres
Gatun
Bique
Cruces
Gorgona
Panama
BAY OF PANAMA

EUROPE
SCALE OF MILES
0 100 200 300 400
Comparative Area
400 MILES
250 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
Longitude West from Greenwich
Longitude East from Greenwich
ARCTIC OCEAN
NORTH SEA
BALTIC SEA
ENGLISH CHANNEL
BAY OF BISCAY
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
ADRIATIC SEA
AEGEAN SEA
IONIAN SEA
TYRRHENE SEA
ICELAND
BRITISH ISLES
SCANDINAVIA
FINLAND
RUSSIA
POLAND
GERMANY
FRANCE
SPAIN
PORTUGAL
AUSTRIA-HUNGARY
SWITZERLAND
BELGIUM
HOLLAND
DENMARK
SERVIA
BULGARIA
ROUMELIA
TURKEY
ASIA MINOR
CRIMEA
CAUCASUS MTS.
ARMENIA
PERSIA
CYPRUS
CRETE
SICILY
CORSICA
SARDINIA
BALEARIC IS.
AFRICA
ALGIERS
TUNIS
FEZ
STOCKHOLM
CHRISTIANIA
COPENHAGEN
ST. PETERSBURG
MOSCOW
BERLIN
VIENNA
PARIS
LONDON
MADRID
LISBON
ROME
CONSTANTINOPLE
ATHENS
BELGRADE
SOFIA
BUCHAREST
Tokyo
Sitka
New York

PLATE N.

CENTRAL EUROPE
SCALE OF MILES
0 50 100 150 200 250 300
NORTH SEA
BALTIC SEA
ENGLISH CHANNEL
IRISH SEA
GERMANY
FRANCE
SWITZERLAND
AUSTRIA-HUNGARY
ITALY
RUSSIA
SPAIN
MEDITERRANEAN SEA
ADRIATIC SEA
TYRRHENIAN SEA
IONIAN SEA
AEGEAN SEA
BLACK SEA
ARCTIC OCEAN
ATLANTIC OCEAN
AFRICA
BERLIN
VIENNA
PARIS
LONDON
ROME
CONSTANTINOPLE
BUKHAREST
BELGRADE
SOFIA
ATHENS
Longitude A West 0 B 5 Longitude C 10 East D 15 from E 20 Greenwich F 25 G 30 H

PLATE O.

BOSTON PUBLIC LIBRARY

PALESTINE
A. D. 70
SCALE OF MILES
0 10 20 30 40
Sidon
Damascus
Sarepta
SYRIA
Tyre
Mt. Hermon
Cæsarea Philippi
Waters of Merom
Ptolemais
Chorazin
Capernaum
Magdala
Bethsaida
Julias
Gennesaret or Sea of Tiberias
Mt. Tabor
Nain
Gadara
Cæsarea
Jezreel
Mt. Gilboa
SAMARIA
Samaria
Mt. Ebal
Mt. Gerizim
Sychar
River Jabbok
Joppa
Mt. Gilead
Ramoth Gilead
Philadelphia
Lydda
Bethel
Jericho
Bethabara (Rabbath Ammon)
Gilgal
Mt. of Olives
JERUSALEM
Bethany
Azotus
Bethlehem
Ascalon
Gath
Adullam
Hebron
Gaza
JUDEA
Gerar
Aroer
Beersheba
Arcopolis
WILDERNESS OF JUDEA
IDUMÆA
DEAD SEA
MEDITERRANEAN SEA
PLATE E.
Longitude East from Greenwich
New York
San Francisco
EUROPEAN RUSSIA
SIBERIA
CENTRAL ASIA
KIRGHIZ STEPPES
TURKESTAN
EASTERN TURKESTAN
MONGOLIA
CHINESE EMPIRE
MANCHURIA
JAPAN
EMPIRE OF JAPAN
ARCTIC OCEAN
PACIFIC OCEAN
BERING SEA
NORTH AMERICA
ALEUTIAN IS.
KAMCHATKA
OKHOTSK SEA
SEA OF JAPAN
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
PERSIA
ARABIA
HINDUSTAN
INDIA
BAY OF BENGAL
ARABIAN SEA
INDIAN OCEAN
SIAM
FRENCH INDO-CHINA
TIBET
AFGHANISTAN
BALUCHISTAN
KHIVA
BOKHARA
KHOKAND
KASHGAR
YARKAND
KHOTAN
KULJA
URUMTSI
BARKOL
Desert of Gobi
Lake Baikal
Lake Balkash
Aral Sea
Caspian Sea
Black Sea
Mediterranean Sea
Red Sea
Persian Gulf
Gulf of Oman
Gulf of Aden
Gulf of Tonkin
Gulf of Siam
Bay of Bengal
Arabian Sea
Indian Ocean
Sea of Japan
Yellow Sea
East China Sea
South China Sea
Sea of Okhotsk
Bering Sea
Arctic Ocean
Pacific Ocean
Caucasus Mts.
Ural Mts.
Himalaya Mts.
Kuenlun Mts.
Nan-shan Mts.
Thian Shan Mts.
Hindu Kush Mts.
Khingan Mts.
Stanovoi Mts.
Yablonoi Mts.
Verkhoyansk Mts.
Kamchatka Mts.
Taurus Mts.
Elburz Mts.
Zagros Mts.
Suez Canal
Grand Canal
Great Wall of China
Tropic of Cancer
Equator
Arctic Circle
Scale of Miles
0 200 400 600 800 1000 1200
Comparative Area
400 Miles
250 Miles
Penn. 45,000 Sq. Miles
The whole rectangle contains 100,000 Sq. Miles
Longitude East from Greenwich
A B C D E F G H I J K
a b c d e f g h

AFRICA
SCALE OF MILES
0 100 200 300 400 500 600 800 1000 1500
English
French
Portuguese
German
Italian
Spanish
Railroads: Finished
Proposed
Comparative Area
400 MILES
300 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
SAHARA OR GREAT DESERT
MEDITERRANEAN SEA
BLACK SEA
RED SEA
ARABIA
PERSIA
INDIA
ATLANTIC OCEAN
INDIAN OCEAN
GULF OF GUINEA
EGYPT
LIBYA
TRIPOLI
ALGERIA
MOROCCO
FRENCH WEST AFRICA
SUDAN
NIGERIA
ABYSSINIA
BRITISH EAST AFRICA
UGANDA
CONGO FREE STATE
GERMAN EAST AFRICA
PORTUGUESE WEST AFRICA
ANGOLA
MOZAMBIQUE
MADAGASCAR
CAPE OF GOOD HOPE (CAPE COLONY)
TRANSVAAL COLONY
ORANGE RIVER COLONY
NATAL
BECHUANALAND
DAMARALAND
NAMALAND
CAIRO
ALEXANDRIA
KHARTUM
ADDIS ABEBA
ZANZIBAR
MOMBASA
DAR-ES-SALAAM
LOANDA
CAPE TOWN
DURBAN
PRETORIA
JOHANNESBURG
TRIPOLI
ALGIERS
TUNIS
FEZ
TIMBUKTU
ZUNGERU
KUMASSI
MONROVIA
FREETOWN
DAKAR
BATHURST
BOLAMA
LAGOS
OLD CALABAR
LIBREVILLE
LOANDA
BENGUELA
MOSSAMEDES
WALFISCH BAY
WINDHOEK
ST. HELENA
ASCENSION I.
MADEIRA IS.
CANARY IS.
SALVAGES
CAPE VERDE IS.
TROPIC OF CANCER
TROPIC OF CAPRICORN
EQUATOR
Longitude 10 West from Greenwich
Longitude East from Greenwich
New Orleans
Rio de Janeiro
Calcutta
Singapore
Sydney

SOUTHEAST ASIA
SCALE OF MILES
0 50 100 200 300 400 500 600 700 800
Comparative Area
400 MILES
250 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
ARCTIC OCEAN
EUROPE
SIBERIA
CHINESE EMPIRE
INDIA
INDIAN OCEAN
PACIFIC OCEAN
AFRICA
PERSIA
ARABIA
TURKESTAN
MONGOLIA
GOBI DESERT
HINDUSTAN
BAY OF BENGAL
ARABIAN SEA
SOUTH CHINA SEA
PHILIPPINE IS.
JAPAN
EAST INDIES
BORNEO
SUMATRA
JAVA
CELEBES
LUZON
MINDANAO
SULU IS. (JOLO)
CEYLON
AFGHANISTAN
BALUCHISTAN
SIAM
FRENCH INDO-CHINA
BRITISH NORTH BORNEO
BRUNEI
Gulf of Siam
Strait of Malacca
Java Sea
Celebes Sea
Molucca Passage
Longitude East from Greenwich
EQUATOR
PLATE S.

AUSTRALASIA, MALAY ARCHIPELAGO AND MICRONESIA
SCALE OF MILES ON THE EQUATOR
0 100 200 300 400 500 600 700 800 900 1000
HAWAIIAN IS.
(To United States)
SCALE OF MILES
0 20 40 60 80 100
SAMOA IS.
SCALE OF MILES
0 10 20 30 40 50
Comparative Area
400 MILES
260 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
PLATE T.
Longitude 100 A 110 B 120 C 130 East D 140 from E 150 Greenwich F 160 C 170 H 180 Longitude I West 170
Longitude 159 West 158 157 from 156 Greenwich 155
Longitude 172 30′ 172° 171 30′ West 171° from 170 30′ Greenwich 170° 169 30′
SOUTH CHINA SEA
PHILIPPINE ISLANDS
(To United States)
MICRONESIA
CAROLINE ISLANDS
(To Germany)
MARSHALL, GILBERT, RALIK CHAIN, RATAK CHAIN
PACIFIC OCEAN
SULU SEA
CELEBES SEA
BORNEO
SUMATRA
JAVA
MALAY PENINSULA
CELEBES
BANDA SEA
FLORES SEA
ARAFURA SEA
TIMOR SEA
TORRES STRAIT
CORAL SEA
NEW GUINEA
(British)
(German)
BISMARCK ARCHIPELAGO
SOLOMON ISLANDS
(British)
NEW HEBRIDES
NEW CALEDONIA
(French)
FIJI ISLANDS
(British)
TONGA ISLANDS
(British)
SAMOA IS.
(To Ger.)
(To U.S.)
AUSTRALIA
NORTHERN TERRITORY
WESTERN AUSTRALIA
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA
INDIAN OCEAN
TROPIC OF CAPRICORN
EQUATOR
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
HAWAII
OAHU
KAUAI
MAUI
MOLOKAI
LANAI
KAHOOLAWE
HONOLULU
Mauna Kea
Mauna Loa
Kilauea
Hilo
Kailua
Kawaihae
Lahaina
Waimea
Waialua
Honolulu
Pearl Harbor
Kaahumanu
Kamehameha
Alenuihaha Channel
Upolu Pt.
Kohala
Waipio
Kaumuhahi
Ka Lae Pt.
Punaluu
Spreckelsville
Kamalo
Pololo Ch.
Kahului
Waimea Bay
Waianae
Kaiwi Channel
Niihau
Kauai
Kolea
Waialeale
Hanalei
Manila
Singapore
Batavia
Surabaya
Makassar
Menado
Davao
Zamboanga
Iloilo
Cebu
Saigon
Bangkok
Hue
Rangoon
Penang
Malacca
Sandakan
Kuching
Brunei
Pontianak
Palembang
Jambi
Padang
Medan
Acheen
Benkulen
Bintulu
Labuan
Jesselton
Tarakan
Balikpapan
Samarinda
Banjermasin
Surakarta
Cheribon
Bandung
Sourabaya
Amboina
Ternate
Halmahera
Gilolo
Timor
Kupang
Dili
Roti
Sumba
Sumbawa
Lombok
Bali
Java
Sumatra
Borneo
Celebes
Luzon
Mindanao
Mindoro
Palawan
Negros
Bohol
Samar
Leyte
Panay
Cebu
Iloilo
Zamboanga
Davao
Surigao
Camiguin
Basilan
Sulu
Jolo
Tawi-Tawi
Balabac Str.
Sulu Sea
Celebes Sea
Molucca Passage
Molucca Sea
Gilolo Passage
Halmahera or Gilolo
Waigiu I.
Misore Is.
Asi
Mawa
Kapaur
Pt. D'Urville
L'Echiquier Is.
St. Matthias I.
Squally I.
New Hanover
New Mecklenburg
Admiralty Is.
Kaiser Wilhelmsland
Friedrich Wilhelmshafen
Wilhelms Land
Archipelago
Bougainville I.
Choiseul
Isabel
New Georgia
Malaita I.
Guadalcanar
San Cristoval
Santa Cruz Is.
Louisiade Arch.
South East I.
Rennell
Torres Is.
Banks Is.
Espiritu Santo
Malicolo I.
Erromango I.
Tanna I.
Belep Is.
Uvea
Loyalty Is.
Noumea
Mare I.
Kunie I.
Vanua-Levu
Viti-Levu
Suva
Kandavu
Eastern Group
Tongatabu
Hapai Is.
Ono Is.
Norfolk I.
(Br.)
Lord Howe I.
(Br.)
Kermadec Is.
(Br.)
Enderbury I.
Mc Kean I.
Phœnix Is.
St. Augustine I.
Ellice Is.
Ellice (British) Islands
Tokelau or Union Is.
Mitchell I.
Sophia I.
Christmas I.
(Br.)
Cocos Is.
(To Netherlands)
Diamond Pt.
Acheen Head
Straits Settlements
Malay Peninsula
Pahang
Tringanu
Patani
Cambodia
Tantalam
Cape Padaran
Cape Bojeador
Cape Engaño
Vigan
Camaran
Lingayen
Manila
Bolinao
Mindoro
Calamianes Is.
Albay
Catanduanes
Taibalogan
Samar Str.
Leyte
Surigao
Caraga
Pt. Tinaca
Talaur Is.
Talautse Is.
Sangi Is.
Sangi
Siao
Nias
Batu Is.
Nata
Padang
Pontianak
Simpang
Sampit
Banca
Billiton
Krakatoa
Sunda Str.
Java Hd.
Cheribon
Samarang
Rembang
Pulo Laut
Makassar
Buton
Buro
Ceram
Kei Is.
Aroo Is.
Timor Laut
Frederick Henry I.
Wombokka
Romadi
Port Moresby
Gulf of Papua
Owen Stanley Mt.
Huon G.
Manning Str.
New Pomerania
New Georgia
Choiseul
Isabel
Bougainville I.
Mecklenburg
New Hanover
Squally I.
St. Matthias I.
L'Echiquier Is.
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Celebes Sea
Sulu Sea
Balabac Str.
Sandakan
Brunei
Labuan
Jesselton
Tarakan
Bulungan
Talaur Is.
Talautse Is.
Sangi Is.
Menado
Davao
Zamboanga
Iloilo
Cebu
Saigon
Bangkok
Hue
Rangoon
Penang
Malacca
Singapore
Batavia
Surabaya
Makassar

ANCIENT ROME
ITALY AT THE TIME OF AUGUSTUS
SCALE OF MILES
GREECE AT THE TIME OF PERICLES
SCALE OF MILES
PALESTINE, LOWER EGYPT AND PART OF ARABIA A.D. 70
SCALE OF MILES
Longitude East from Greenwich
MARE TYRRHENUM
MARE ADRIATICUM
MARE AEGEUM
MARE IONIUM
MARE CRETICUM
MARE CARPATHIUM
MEDITERRANEAN
SINUS LIGUSTICUS
SINUS THERMAICUS
SINUS ARGOLICUS
SINUS LACONICUS
SINUS MESSENIACUS
SINUS CORINTHIACUS
SINUS SARONICUS
SINUS ARGIVUS
SINUS ARGOLICUS
SINUS ADRAMYTTENUS
SINUS HERMAEUS
SINUS CRISSAEUS
SINUS PAGASETICUS
SINUS SINGITICUS
SINUS STRYMONICUS
SINUS TORONAICUS
SINUS CASSANDRENSIS
SINUS PALINURUS
SINUS TARENTINUS
SINUS HERACLEA
SINUS CROTONIATES
SINUS LOCRENSIS
SINUS TERINAEUS
SINUS SCYLLETICUS
SINUS HIPPONIATES
SINUS VIBONENSIS
SINUS HERCULIS
SINUS CAMPANUS
SINUS CUMANUS
SINUS PUTEOLANUS
SINUS HERACLEOTICUS
SINUS CAUDINUS
SINUS CARPATHIUM

COMMERCIAL MAP OF THE WORLD

EXPLANATION:

Railroads
Steamship Routes
Sailing Routes
Caravan Routes
Ocean Cable and Trans-Continental Telegraph Lines
Warm Currents
Cold Currents

Products and Industries are shown in Red Type

REFERENCE TO COLORS.

PINK indicates regions now engaged in foreign commerce.
ORANGE indicates regions that will in time develop foreign commerce.
YELLOW indicates deserts, highlands, and polar regions of little, if any, commercial importance.
BLUE lines indicate the portions of principal rivers open to navigation.

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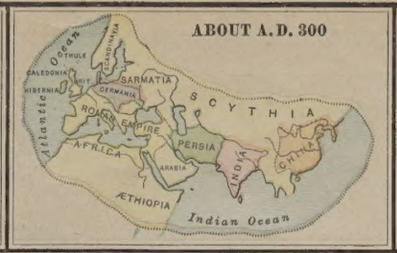
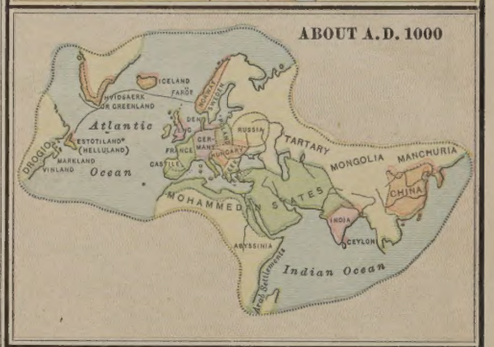
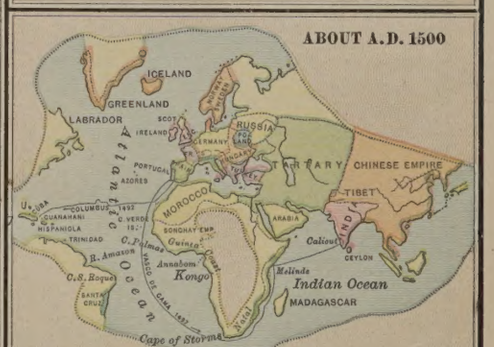


THE WORLD TO-DAY.





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SUPPLEMENT TO FRYE'S GEOGRAPHY

THE NEW ENGLAND STATES

BY

WILLIAM MORRIS DAVIS

PROFESSOR OF PHYSICAL GEOGRAPHY IN HARVARD UNIVERSITY

BOSTON, U.S.A., AND LONDON

GINN & COMPANY, PUBLISHERS

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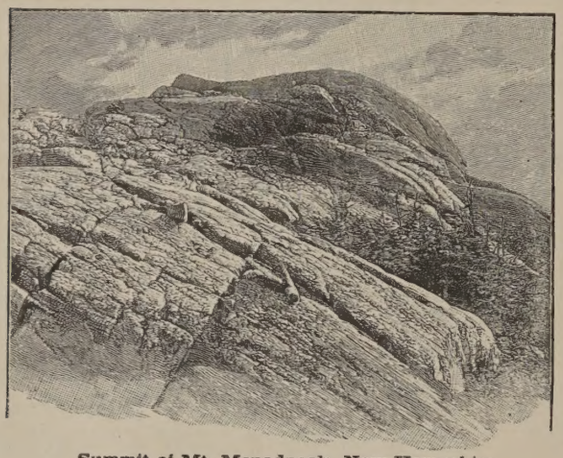
68.5

THE NEW ENGLAND STATES.

1. Relief and Drainage.[1]

Locate this group of states.

The area of New England is 66,465 square miles, — about one fiftieth that of the United States.



Summit of Mt. Monadnock, New Hampshire.

Use the scale on the map,[1] and find how many miles New England measures north and south; — east and west.

What states of our country extend farther north than Maine? Name two countries in Europe, and two in Asia, that are in about the same latitude as New England. What meridian is near the eastern point of Maine? Name two countries in South America that are crossed by this meridian. Which is farther east, Cape Horn or the most easterly point of Maine?

What part of New England is halfway between the equator and the pole?

What countries in the southern hemisphere are as far from the equator as New England?

The greater part of the surface of New England descends from the interior towards the coast, forming a rolling upland, above which mountains rise and below which valleys have been worn out.

The interior is rugged and mountainous. This part belongs in the Old Appalachian range. Towards the coast, the uplands are lower and more open to settlement.

New England Upland.

This portion belongs in the piedmont belt; but no distinct boundary can be drawn between the two parts.

[1] For map of New England, consult Index.

A small portion of southeast Massachusetts may be included in the Atlantic coastal plain.

Standing on a hill, a little above the general level, one may see the rolling surface of the upland for many miles on all sides. In the interior, its height reaches one or two thousand feet. It may there be thought of as an uneven plateau.

On the northeast the upland continues into Canada. On the north it slopes gradually into the St. Lawrence valley. On the west it descends more rapidly into the Great Valley, here known as the Hudson-Champlain valley. On the southwest it extends across southern New York, where it is cut by the deep gorge of the Hudson.

The Connecticut valley is a long and deep trough extending southward through the upland, west of its middle part.

The chief groups or ranges of mountains of the interior highland are the White mountains of New Hampshire, the Green mountains of Vermont, and a broken chain crossing northern Maine.

Besides these groups or ranges, there are many single mountains rising above the general level of the upland, — like Monadnock in New Hampshire, Wachusett in Massachusetts, Green mountain (on Mt. Desert) on the coast of Maine, and Ascutney in Vermont.

Coastal Plain, Southeast Massachusetts.

Many of these lone mountains look like old volcanoes; but instead of having been built up by eruption, their height is due to the excessive hardness of their rocks. They have strongly resisted weathering, while the less resistant rocks of the surrounding region have wasted away. These mountains show that the whole region was once much higher than it now is.

The divides between the long rivers that flow south or southeast to the Atlantic and the shorter rivers that flow west to the Hudson-Champlain valley or north to the St. Lawrence valley do not follow the chief mountain ranges, but lie on the upland east of the mountains in Vermont, and north of them in New Hampshire and Maine.

The Missisquoi, Lamoille and Winooski rise east of the Green mountains, but flow westward into Lake Champlain.

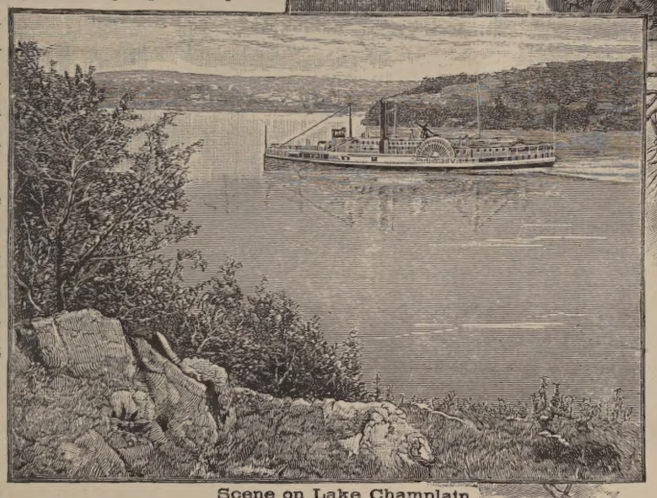
The Connecticut and Androscoggin drain a region north of the White mountains, as well as south and southeast. The Kennebec, Penobscot and the St. John gather their headwaters beyond the highest mountains of northern Maine.

The valleys that are worn below the general level of the upland vary greatly in form. They are generally deep and narrow in the interior, where the upland is high; but shallow and wide near the coast, where the upland is lower. The latter portion of the country is therefore more easily occupied and traveled over, and contains the greater part of the population.

Where the upland is high and the rocks are so hard that they weather slowly, the valleys are deep and narrow, — like the Deerfield valley in western Massachusetts. Such valleys are useful in guiding roads and railroads; they give place for many busy villages; but they afford little room for fields and for farming. The farms thereabout are chiefly on the uplands.

Some of the valleys following belts of weak rocks are broad and open, like lowlands within the upland. Such is the greater part of the broad lower Connecticut valley. Much of the best farming land and a number of the larger cities are found in the open valleys of the interior.

New England is part of the region in northeast America that was many thousand years ago deeply covered by ice. The ice sheet filled its valleys, spread over its uplands and buried all or nearly all its mountains out of sight, creeping slowly to the sea on the east and south, and for a time converting the region into an ice plateau, like that which covers most of Greenland to-day.



Scene on Lake Champlain.

The very irregular shore lines and the numerous islands of many New England lakes, — such as Moosehead and Winnepesaukee, — indicate that they are generally caused by choking ancient valleys with glacial drift. The lake waters therefore rise on the valley slopes behind the drift barrier, forming an irregular shore line, like that formed where the land sinks partly beneath the sea.

Lakes are often used as natural reservoirs for water power in their outlet streams, and for water supply of cities and towns.

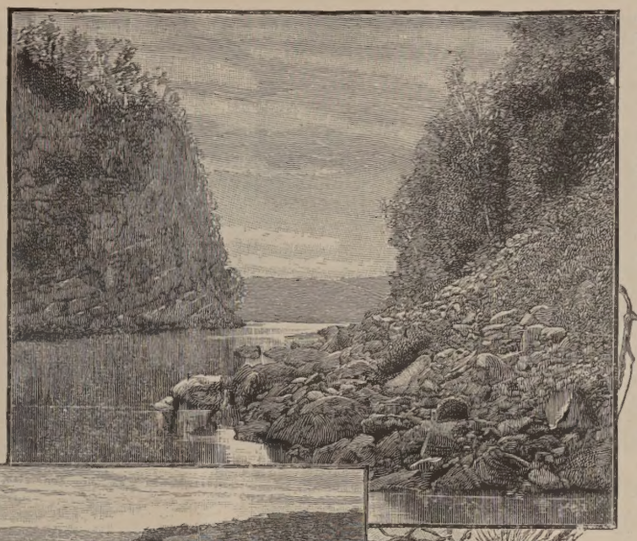
New England stands lower now than formerly, for its valleys are partly drowned, and its coastline is very irregular or broken. The Penobscot and Narragansett bays, and many other arms of the sea form excellent harbors. These have been of much importance in determining the place of early settlements along the coast, and thus in fixing the position of many important cities, such as Portland, Boston, Providence and New Haven.

2. Climate.

Consult Index for this topic.

The position of New England in the cool belt and in the northeast part of our country gives it a severe climate. In spring and autumn there are rapid changes of season. In winter the weather changes are numerous and strong.

July, the warmest month, averages about 75° in the south and 65° in the north. Southwesterly winds then prevail, bringing warm or hot air from the Southern states. During the cloudy or stormy weather caused by passing storm eddies, warm damp southerly winds are often drawn in from over the Gulf stream; as the storm center passes by, the sky clears and fresh northwest winds give cooler weather for a day or two.



Gorge of Winooski River, Vermont.

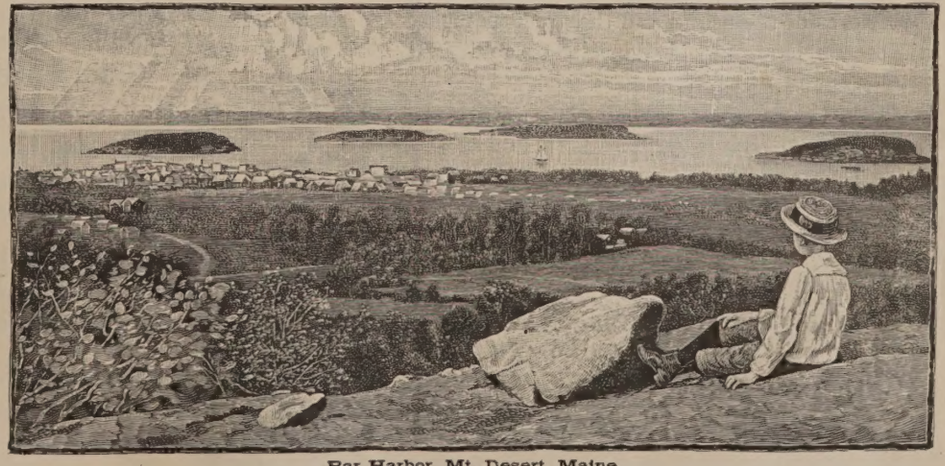
In the fair weather of summer, the inland valleys have occasional spells of very hot weather, while the uplands have hot days but cool nights. The coast is cooled by the noonday sea breeze.

Much rain falls in summer from thunderstorms which drift across New England from the west, watering a belt of land under their heavy clouds.

The winters in New England are cold and severe. January, the coldest month, averages about 15° in the north and 30° in the south. The prevailing winter winds are from the northwest, bringing cold air from the Canadian plains. Lakes and rivers are frozen and the ice is then harvested. The eddying storms of winter are frequent and strong. They move rapidly eastward and produce many changes in the winds and temperature.

When the winter winds come from the south from over the Gulf stream, our weather is comparatively mild, with low clouds and rain or snow. When the winter winds come from the Labrador current, we have the chilling "northeaster," with heavy snow. These cloudy winds are followed by clear and cold northwest winds, bringing cold waves.

The lowest temperatures of winter occur in the calm nights that follow cold waves. At such times the air in the valleys is colder than that on the uplands and hills. Even on Mt. Washington it may be warmer than on the surrounding lower lands.



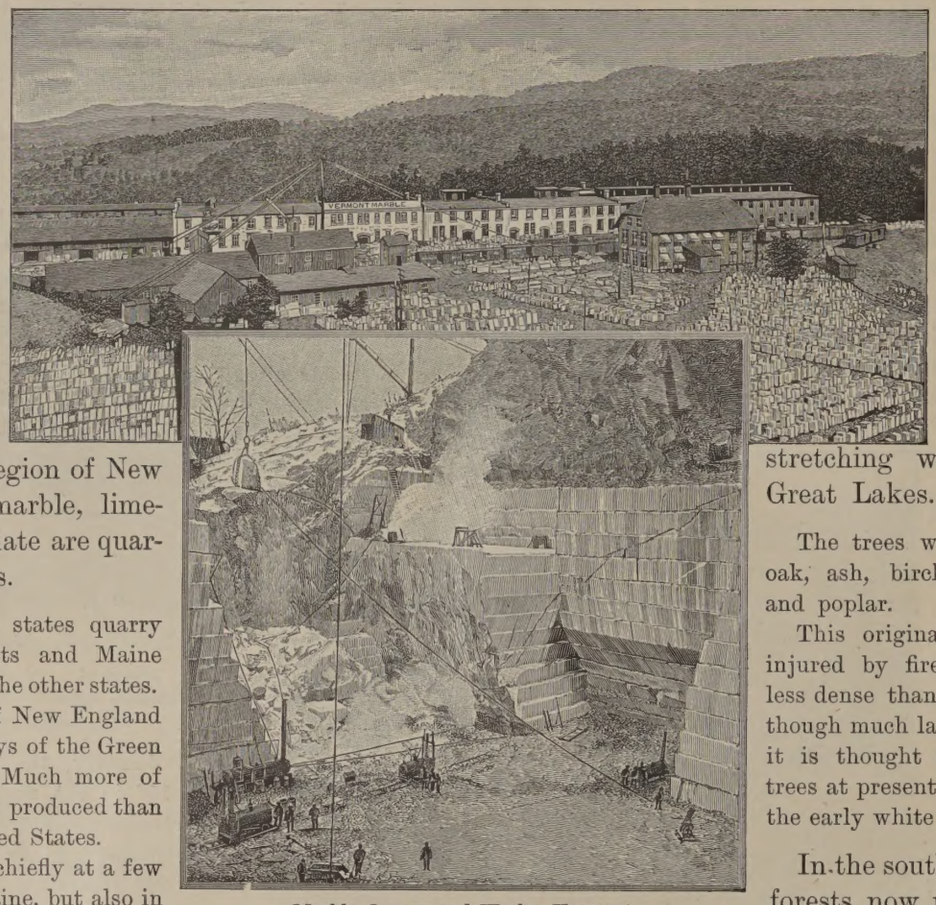
Bar Harbor, Mt. Desert, Maine.

The total annual rainfall, including melted snow, averages about 35 inches in the northwest part of New England, increasing to about 50 inches in the south and along the coast. On the mountains the rainfall is heavier; the top of Mt. Washington having an average rainfall of 85 inches.

The rainfall of New England is well distributed through the year and injurious drouths seldom occur.

3. Mineral Products.

Building stones constitute the most valuable mineral products of the old mountain region of New England. Granite, marble, limestone, sandstone and slate are quarried in large quantities.



Marble Quarry and Works, Vermont.

All the New England states quarry granite, but Massachusetts and Maine yield twice as much as all the other states.

The marble quarries of New England are almost all in the valleys of the Green mountains in Vermont. Much more of this beautiful stone is here produced than in all the rest of the United States.

Limestone is quarried chiefly at a few points on the coast of Maine, but also in the Green mountain valleys.

Red sandstone, or "brownstone," is worked extensively in the Connecticut valley, but Ohio produces much more sandstone than any other state.

Roofing slate occurs among the Green mountains, and in Maine, but a greater quantity is produced from the Great Valley in Pennsylvania.

Mica for stove doors, soapstone for sinks, emery and whetstones for sharpening tools, kaolin for pottery, clay for brick-making, ocher for paint, are produced in various parts of New England.

The ores of the useful and the precious metals are not abundant in New England. A few deposits of gold and silver and copper have been found, but they have seldom been a source of profitable mining. Rare and beautiful minerals are found at many places in the old rocks of New England. Among the most noted are the tourmalines of Maine, the beryls (the largest known) of New Hampshire and Connecticut; as well as topaz, amethyst and rose quartz from various localities. Mineral spring water from New Hampshire, Maine and Massachusetts is sold annually to the value of nearly a million dollars.

Vinalhaven Granite Works.

4. Plants and Animals.

When first settled by white people, New England was covered with an almost continuous forest, — a part of the forest belt stretching westward beyond the Great Lakes.

The trees were chiefly pine, spruce, oak, ash, birch, hemlock, maple, elm and poplar.

This original forest was frequently injured by fire. Its tree-growth was less dense than that of to-day; and although much land has now been cleared, it is thought that there are as many trees at present in New England as when the early white men came.

In the south of New England the forests now remain scattered over the uplands; in the north they extend over a large part of the surface.

The abundance and variety of hard-wood and soft-wood trees have given rise to an active lumber industry in the interior, especially in Maine. In many villages and cities, furniture and wooden ware are manufactured. Much lumber is used for boxes in which the manufactured products of New England are shipped to other states. A large amount of wood is made into pulp for the manufacture of paper. Shipbuilding is practiced in several ports, but less actively than formerly.

Grain is not raised in large quantity in New England. Hay, garden products, apples and other fruits are of more importance. Cranberries are a valuable crop in the meadows among the hills of southeastern Massachusetts. Much tobacco is raised in the Connecticut valley.

The early settlers found numerous wild animals; but now all the larger animals have disappeared, except in the great forests of the north.

The larger animals still remaining are the moose, caribou, deer, bear and wolf. The smaller animals of the forest area in the north are the catamount, lynx or wild cat, beaver, sable, otter and marten.

The fox, raccoon, hedgehog or porcupine, skunk, woodchuck, rabbit, squirrel, muskrat, mink and weasel are more common and widely distributed.

The larger birds are the eagle, hawk, crow, owl, duck and partridge. Many kinds of geese pass north and south over New Eng-

land in their annual migrations. Smaller birds are found in great variety.

The vast numbers of food fish found in the shallow waters along the New England coast, and on the "banks" to the northeast, have given rise to fisheries of great importance, in which many people are engaged.

What have you read about these fisheries?
Which are the most important fisheries on the New England coast?
What is the chief fishing port of the Union?

Fishing was one of the earliest profitable industries in which the New England settlers engaged.

5. Settlement of New England.

The discoveries in New England by Norsemen from Iceland or Greenland, before the time of Columbus, are so vaguely recorded that no definite account of them can be given.

For more than a century after the discovery of America by Columbus, New England was visited only by explorers. Among these was Captain John Smith, who founded the Jamestown colony in Virginia (1607). Seven years later he made a voyage from England to our coast. He returned home with a cargo of fish and furs; and in order to attract colonists here from old England, he called the region *New England*.

Cutting Statues in Westerly Granite.

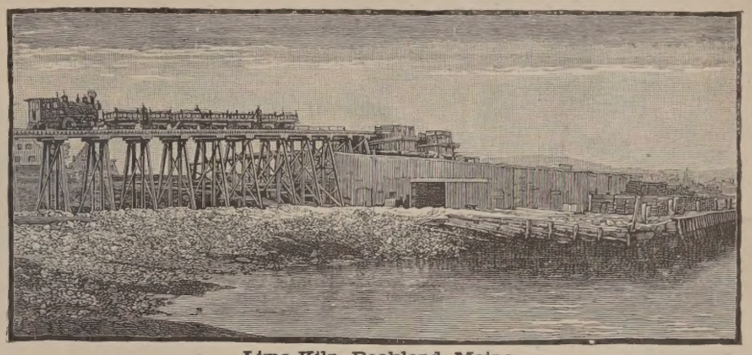
The first permanent settlement in New England was made in 1620, at Plymouth, by a band of about one hundred English colonists.

These were "Separatists" from the Church of England who were called *Pilgrims*, because they had left their English homes and gone to Holland where they might be free to follow their religious belief. Dissatisfied in Holland, a party of Pilgrims returned to England, and thence sailed in the "Mayflower" for America. After sighting Cape Cod and touching at various places, they landed at Plymouth.

Other colonists known as "Puritans" soon followed, making settlements at Salem (1628), Boston (1630), and neighboring points. These later settlements formed the colony of Massachusetts Bay, of which Boston soon became the chief place. About three quarters of a century after the landing of the Pilgrims, their colony was joined to the Massachusetts Bay colony.

All these settlements were made in sheltered bays or on tidal rivers, where vessels could find protection in stormy weather.

Among the settlements farther north were those at



Lime Kiln, Rockland, Maine.

Saco, Portsmouth and Dover, thus founding what later became Maine and New Hampshire.

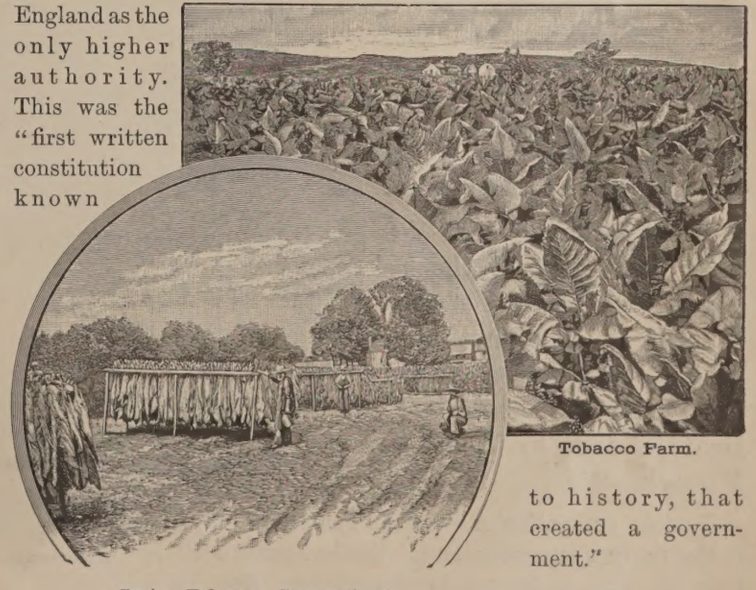
These colonies grew more slowly than those farther south. The settlements in Maine were later joined to the more powerful colony of Massachusetts; and those in New Hampshire were from time to time under the same protection.

As the number of people along the coast increased, they made settlements farther inland, generally selecting the more open valleys where good land was found for farming on the terraces or flood plains of the streams, or on the drift-covered slopes of the uplands.

Connecticut was settled in 1635–6, by people from towns of the Plymouth and Massachusetts Bay colonies. These people were tempted to move inland, by reports of the fertility of the inner valleys. They founded the towns of Wethersfield, Hartford and Windsor.

Before the time of these settlements, Connecticut had been visited by the Dutch from their colony at New Netherlands (now New York), and a trading fort had been built on the site of Hartford. This was afterwards abandoned.

In 1639, the Connecticut towns — until then a branch of Massachusetts — adopted a constitution for self-government, recognizing the king of England as the only higher authority. This was the "first written constitution known to history, that created a government."

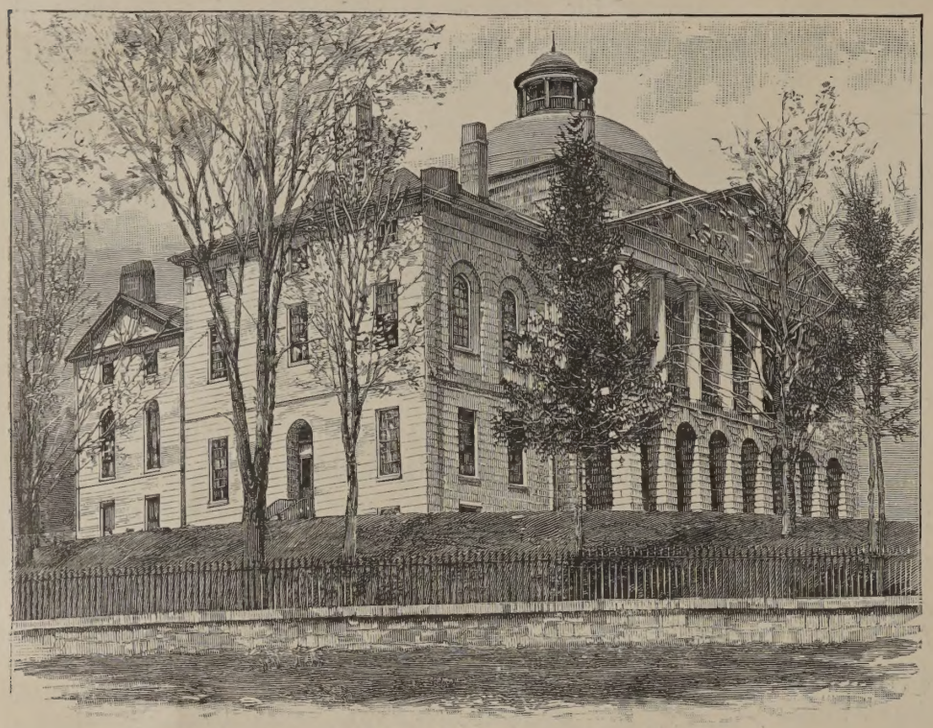


Tobacco Farm.

Curing Tobacco, Connecticut.

Eight years after Boston was founded, a colony of Puritans settled in New Haven, and other settlements were made near by.

Later these were united with the older Connecticut colony. The first permanent settlement in Rhode Island was made at Providence (1636), by Roger Williams with a band of followers from Salem.



Statehouse, Augusta.

Williams was a Puritan minister at Salem. He believed that the government should not exercise authority over religious opinions, — a belief now everywhere accepted in this country. For preaching this doctrine, Williams was banished from the colony. After many hardships he reached the head of Narragansett bay. Here he bought land from the Indians, and founded the colony of Providence. Other settlements by refugees from Massachusetts were soon made on Narragansett bay, at Portsmouth, Newport, Wickford and Warwick. At length all the settlements on this bay were united into one colony called the colony of "Rhode Island and the Providence Plantations." Officially, the present state still retains this double name, though commonly known as Rhode Island.

The interior state of Vermont was naturally the last of the New England states to be settled. The first permanent settlement was made on the "Dummer meadows," near Brattleboro, by colonists from Massachusetts.

Statehouse, Montpelier.

Further occupation of Vermont was slow. It was never a separate colony. Settlers entered from the east, under grants of land from New Hampshire; and from the west under grants from New York, thus causing a long dispute between these colonies. At length the English king decided that the west bank of the Connecticut river should be the boundary between New York and New Hampshire. The New Hampshire settlers west of the river were dissatisfied with this, and formed a separate government the year after the signing of the Declaration of Independence.

In these early years the people lived in a very primitive way. There were no steamships. The sailing vessels in which the colonists crossed the ocean were not so large as many of the schooners that now trade along our coast. There were no steam engines, no railroads, no telegraphs, no newspapers.

There were small sawmills, gristmills and tanneries; but for a long time there were no factories. Nearly all the people were farmers, traders or fishermen.

Thread was spun and cloth was woven by hand. Most families made their own rough "homespun" clothing. The finer cloth, and nearly all manufactured articles, were for a long time brought from England.

The forests and harbors promoted shipbuilding. Many vessels were employed in the fisheries, and in trading along the coast. Some even made long voyages to England and the West Indies.

The public affairs of each small community, or *town*, were discussed and settled by the legal voters in a meeting held once a year. Town officers were then elected to look after the collection of taxes, the making and keeping of roads, the conduct of schools and other public matters. In this simple way, the foundation of our present form of government was laid.

As the number of people increased, the public affairs of each colony were settled in a "General Court," to which delegates were elected by the voters in towns. Governors for the colonies were generally elected by the people; but in Massachusetts, from 1692 until the Revolution, they were appointed by the king of England.

During the early years there was often trouble with the Indians whose lands the settlers had taken. Many little battles were fought, in which the Indians were usually defeated.

At present there are few Indians in New England. In 1890 there were 559 in Maine, at Oldtown and elsewhere in the southeastern part of the state. The Penobscot tribe sends a representative to the legislature. In New Hampshire there were only 16; in Vermont, 34. Massachusetts then had 428, on the peninsula of Cape Cod and on Marthas Vineyard. Rhode Island had 180 Indians, mostly in Washington county; and Connecticut had 228, chiefly in New London county.

The Indians of New England have long since given up their savage customs.

At the time of the war of the Revolution, there were thirteen colonies that became separate states. Those in New England were Massachusetts (including Maine), New Hampshire, Rhode Island and Connecticut.

Vermont was admitted as a state into the Union in 1791, but the "Green Mountain Boys" took an active part in the Revolution.

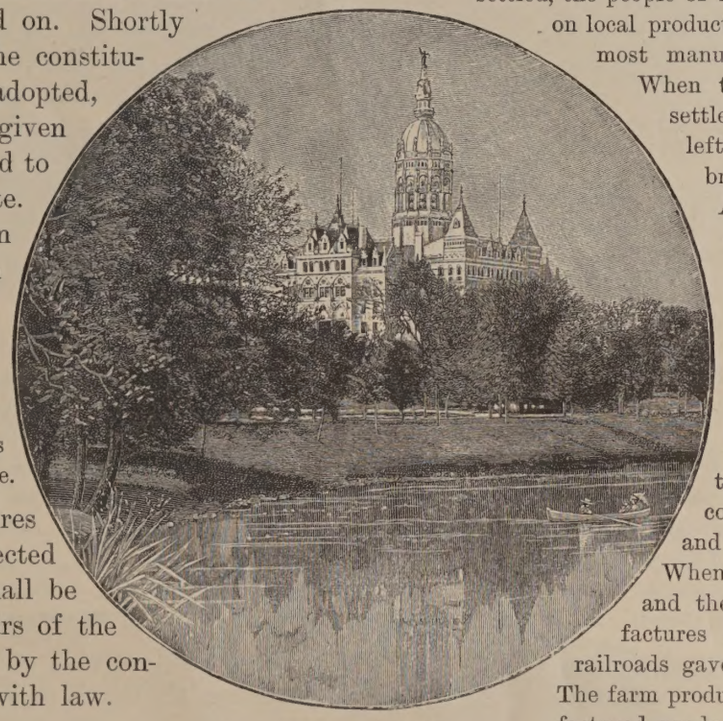
Maine was not separated from Massachusetts, to become a state, until 1820.

6. Government of the States.

During the Revolution each colony became a state and adopted a constitution, thus establishing the highest law of the state and defining the manner in which its public affairs should be carried on. Shortly after the Revolution, when the constitution of the United States was adopted, the general government was given power to settle affairs that had to do with more than one state. In this way a single nation was made out of the thirteen original states.

The authority of a constitution comes from the consent given to it by a majority of the people of the state. "The people" here means the citizens who have the right to vote.

Each state constitution requires that a Governor shall be elected by the voters; and that it shall be his duty to see that the affairs of the state are executed as directed by the constitution and in accordance with law.



Capitol, Hartford.

In Massachusetts and Rhode Island the Governors are elected for one year; in the other New England states, for two years.

The Governor is aided in his duties by various state officers. Of these the most important are: — the Secretary of State, who has charge of the state records and of correspondence with other states; the Treasurer, who has charge of the state's money; the Attorney-General, who advises the other state officers in matters of law, and who has charge of state suits in the courts; the Superintendent of Schools (called by different titles in different states), who has general oversight of the public schools.

The Governor and all these state officers form the *executive department* of the state government.

In order to meet the new conditions that arise in the growth of a state, the constitution directs that two bodies of law makers, called the Senate and the House of Representatives (together forming the state legislature) shall be elected and shall, subject to the constitution, enact such regulations, or *statutes*, as are needed.

The manner of voting, the number of weeks each year during which schools must be held, the inspection of factories, the season in which game may be hunted or fish taken, and a great number of other public matters are determined by statute law.

The members of the legislature constitute the *legislative department* of the state government.

In order that any disputed questions arising between the citizens of a state shall be fairly settled, they are referred to the courts. After a public hearing, the questions in dispute are decided by the courts, acting under the laws of the state.

All officers of the courts belong to the *judiciary department* of the state government.

7. Growth of New England.

For many years before the interior of the United States was settled, the people of New England supported themselves on local products of farms and fisheries, receiving most manufactured products from England. When the prairie region was opened to settlement, many New England people left their rugged hill country for the broad fields and rich soil of the West. At the same time the ingenuity and enterprise of the New England people were developed by the constant effort needed to gain a living in a new country. Many machines were invented, by means of which manufacturing and other work were greatly aided. The wealth that had been gathered by the people in the cities along the coast enabled them to build mills and factories in the inland towns.

When the settlement of the prairie states and the growth of New England manufactures had well begun, the building of railroads gave great assistance to both regions. The farm products of the prairies and the manufactured products of the East were exchanged by rail, thus promoting the growth of an active trade between the two parts of the country.

Railroads are now widely extended over New England, especially over the piedmont belt and along the chief valleys of the interior, reaching all the important manufacturing and trading cities and towns. On the lower land near the coast a network of railroads connects the important harbor cities with the neighboring inland cities and towns. Farther inland, where the valleys are deeply cut in the upland, most of the railroads follow the river banks, and cross the upland only between the heads of two opposed valleys

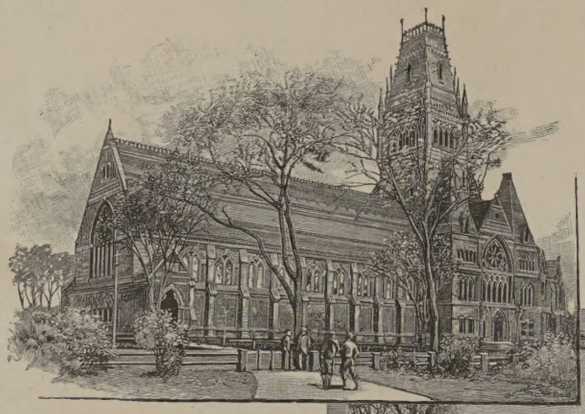
Trace examples of this kind in following on the map the railroads from Fitchburg to Greenfield, and from Springfield to Pittsfield; east and west from Montpelier; on several lines between the Merrimac and Connecticut valleys in New Hampshire. Note the effect of the paired valleys of Millers and Deerfield rivers, and of Chicopee and Westfield rivers, in Massachusetts, on railroad routes. How do the railroads of Connecticut reach the interior of the state from the coastal cities, as shown on the map?

In recent years, many electric railroads have been built. These are rapidly increasing in number and importance.

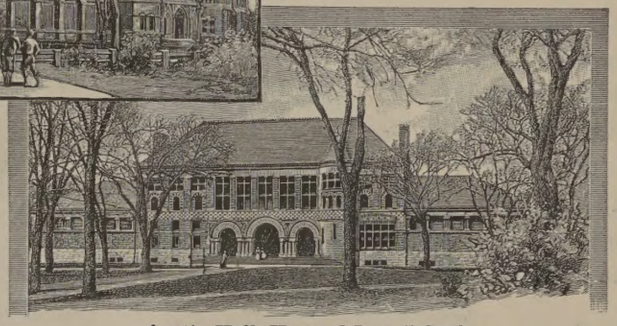
Besides numerous improvements on older forms of machinery, many inventions of great value have been made by New England people. These have frequently led to the building of large manu-

facturing establishments. The following are a few of the most notable inventions: — Blanchard's lathe, for turning ax handles, wagon spokes, musket stocks, etc.; Colt's revolving chamber for pistols; Howe's needle with the eye near the point, for sewing machines; Corliss' "cut-off" valve, for saving steam in engines; Blake's "transmitter," used with telephones; Whitney's cotton gin.

The coastwise trading that had been begun in early times has also been greatly extended. Manufactured articles, lumber, building stone and ice are shipped from New England ports. Coal, grain, cotton, wool and other raw materials are brought back. Hundreds of schooners sail between northern and southern ports. Thus it was that as New England grew in wealth and population, it became more and more a manufacturing and commercial region, and less and less a farming region. For this reason, in the last forty or fifty years many upland villages have decreased in population; but in the same period the factory villages in the valleys have grown rapidly. As a whole, New England has increased wonderfully in both wealth and population.

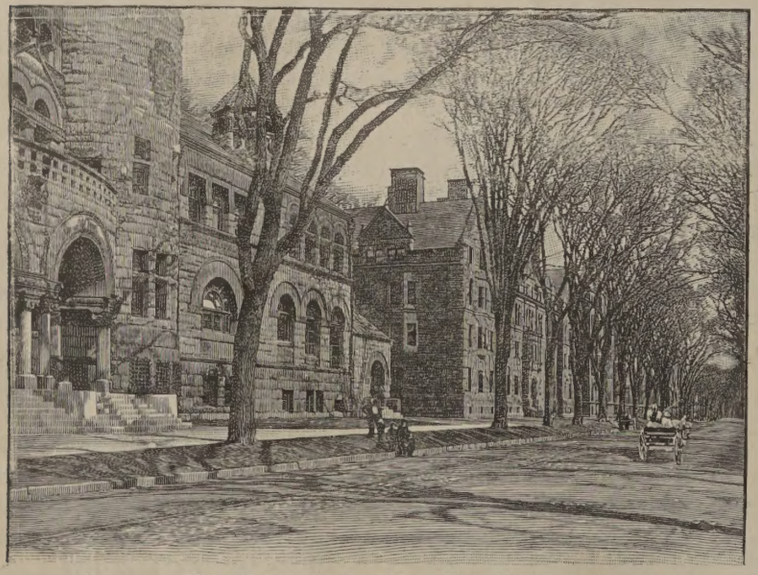


Memorial Hall, Harvard University.



Austin Hall, Harvard Law School.

The opening of new lands for settlement, and the development of new industries, have tempted many people to emigrate from Europe to the United States, — chiefly from the British Isles and Germany. The greater number of these emigrants have landed at New York and gone inland; but many have come to New England, especially to the three southern states. In recent years, large



Yale University Buildings, New Haven.

numbers of French Canadians have come to our manufacturing cities to work in the mills and factories, as at Lewiston, Manchester, Lowell and Waterbury.[1] The people of New England are noted for their thrift, their attention to education and their general culture. Massachusetts ranks in manufactures fourth in the Union.

[1] For area and population of the states, see Supplement.

8. Education.

Among the early acts of the colonists in New England was the establishment of schools and colleges. Before the end of the seventeenth century, nearly every town had its school.

In 1636 the General Court of the Massachusetts Bay colony voted a sum of about $2000 to found a college. In 1638 John Harvard died and left his library and half his property (about $4000) to this college. His name, Harvard, was then given to the college; and the town where it was established, before called *Newtown*, was named *Cambridge*, after the University in England where John Harvard had studied. This was the first college founded in the English colonies. It has now grown to be "Harvard University."

In 1644 a free public school was established by the town of Dedham, near Boston. This school was supported by a general tax on the people, and was the first school of the kind in the country. In 1701 a college was founded by the Connecticut colony at Saybrook. In 1718 this college received gifts amounting to about $4000 from Elihu Yale. The school was then removed to New Haven, and was named after its benefactor. Elihu Yale was born in New England, but went to England and later to India, where he made a large fortune. The institution is now called "Yale University."

Brown University, at Providence, R. I., and Dartmouth College, at Hanover, N. H., were the next colleges founded in New England.

An extensive public school system is at present maintained in all the New England states. There are also many colleges and technical schools where higher studies may be followed.

Besides the primary and grammar schools in every town, there are public high schools in the larger towns and cities. These schools give a general education, or fit their scholars for colleges and professional schools.

There are also many endowed schools and academies, supported in part by money that has been given by generous people.

Manual training schools have recently been established to give attention to various kinds of practical work in preparation for the arts and trades, as well as to broaden the general education. Business schools are found in the larger cities, where book-keeping, telegraphy, etc., are taught. Normal schools, supported by state funds, are established for the special education of teachers.

Technical schools, where engineering, chemistry and similar subjects are taught, are now found in several of the large cities. The most famous school of this kind in New England is the Massachusetts Institute of Technology, in Boston.

While most of the higher institutions of learning are open to men only, some are open to both men and women. There are also several colleges exclusively for women.

Public libraries are established in nearly all cities and in most of the important towns.

MAINE.

Physical Features.

The rugged interior of Maine is a portion of the New England highland. It has a general altitude of from 1500 to 2000 feet, with many hills and low mountains still higher. From the highland, a southward slope leads the numerous rivers across the lower and more open piedmont district to the sea.

The highest mountains of the state lie in an irregular belt about one third of the way from the northern boundary to the coast. They trend northeast from the White mountains to New Brunswick.

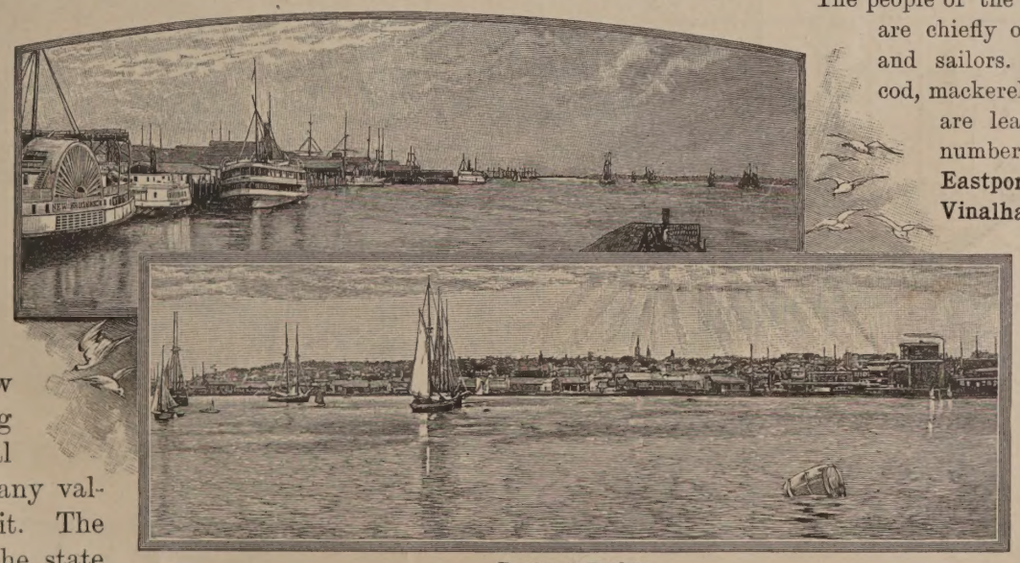
The elevation in feet of the chief mountains of the state is as follows: Katahdin, 5200; Saddleback, 4005; Bigelow, 3600; Baker, 3589; Abraham, 3388; Spencer, 3100; Sugar Loaf, 3000.

Name five rivers of Maine. Which of these are wholly included in the state? Which one rises in Maine, but flows out of the state on the way to the sea? Which one rises in another state, but crosses Maine? Which flows out of Maine and then reënters the state? Which rivers form part of the state boundary? Which drains the larger area, the Kennebec or the Penobscot? Bound Maine.

The large lakes for which Maine is famous occur chiefly in the northern upland, but many smaller ones are found in the more open southern country. Over 1500 lakes and ponds have been counted in the state. Their area approaches a tenth of the land surface.

Moosehead is the largest of these lakes. It has a very irregular shore line and many islands, by which its beauty is much enhanced. Locate six of the large lakes of Maine. By what rivers are they discharged?

Approaching the coast, the southern third of the state belongs to the piedmont belt. It is a rolling upland, with many hills and a few mountains rising above the general level and with many valleys worn below it. The largest cities of the state are in this district.



Portland Harbor.

The seacoast of Maine is the most irregular part of our Atlantic coast. The fringe of headlands and islands, separated by numerous bays and tidal rivers, varies from ten to thirty miles in breadth.

Name the larger bays and islands of the coast. Where is the fringe of headlands and islands broadest? How far is Eastport from Kittery? The coastline of Maine, measured along the mainland and island shores, is 4300 miles.

The tides are very strong in the bays of the eastern coast, sometimes rising and falling as much as thirty feet. They cause rapid currents in the narrow channels, and require high wharves to serve at both high and low water.

Summit of Mt. Katahdin.

Cities and Towns.

The headlands and islands along the coast of Maine are so much separated from one another and from the rest of the state that they have not gained a large population.

There are about 300 islands large enough for occupation, besides uncounted little islands and ledges.

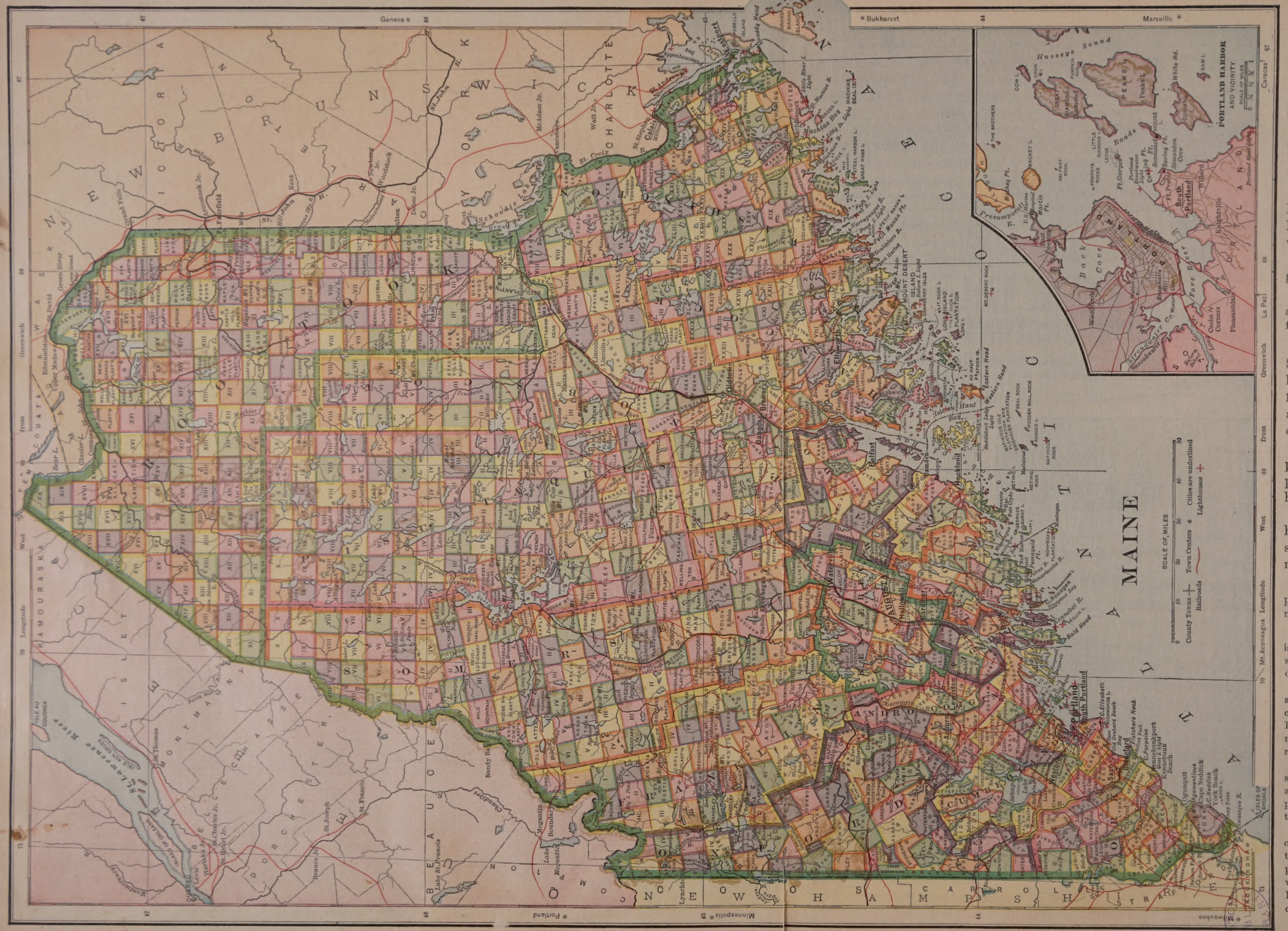
The people of the headlands and islands are chiefly occupied as fishermen and sailors. Drying or canning cod, mackerel, herring and lobsters are leading industries in a number of towns, such as **Eastport** (5311 population)[1]; **Vinalhaven** (2358); **Deer Isle** (2047); **Stonington** (1648). Vinalhaven is well known for its granite.

There are many famous summer resorts on the coast. Among these are **Bar Harbor, Old Orchard** and **York.**

Settlements on the inner bays and tidal rivers have the advantage of well protected waters alongside or within the piedmont belt. Here a number of important cities and towns have grown.

Portland (50,145) is the largest city in the state. It is situated on a fine harbor in Casco bay, near the side of

[1] The figures in parentheses placed after the names of cities and towns give the population according to the national census of 1900. These figures are for reference, and are *not to be memorized.*



Maine towards the other New England states. Important railroad lines from the southwest, northwest and northeast converge to this port.

In winter when the St. Lawrence river is frozen over, Portland serves as a harbor for Canadian steamships.

The most important of the varied manufactures of Portland are machinery, clothing, lumber products, boots and shoes. It exports lumber, wood pulp and fish.[1]

Bath (10,477), on the tide water of the Kennebec, has an excellent harbor and has long been noted for shipbuilding. Iron as well as wooden vessels are here constructed.

Belfast (4615), on Penobscot bay, has a good harbor.

Boots and shoes, lumber, machinery and bricks are manufactured here. Belfast exports granite and farm products, and has shipyards.

The port of **Kittery** (2872) has a United States navy yard. **Hallowell** (2714) has the largest granite quarries in the state. **Rockland** (8150), **Thomaston** (2688), **Camden** (2825) and **Rockport** (2314) quarry and burn great quantities of limestone, and build ships.

The head of tide water is always a favorite place for settlement. In New England, water power is here frequently combined with harborage.

Augusta (11,683), at a water power at the head of tide on the Kennebec, was chosen as state capital in 1832, on account of having a more central location than Portland.

The capital city has important cotton factories, publishes a large number of weekly papers, and manufactures house finishings, paper and wood pulp.

[1] The text in small type under "Cities and Towns" is placed here mainly for reference. Pupils should study such text relating to places near their homes, but it is not desirable to try to memorize all the text in small type.

The detailed knowledge of the minor industries of cities and towns is far less important than the discovery of the conditions upon which the growth of such places depends. In connection with the latter, the following suggestions may prove helpful to pupils, and may take the form of a review:

Sketch a map of Maine, or trace a small map of the state, and on it group the cities as follows. First, locate all seaports mentioned in the text; second, locate the places engaged in manufacturing; third, locate cities and towns in the order of population.

Describe the location of the seaports, the manufacturing centers, the great centers of population. Try to tell why the places were there located, — whether because of water power, nearness to raw material, navigable water, or otherwise. The same form of exercise may be used for all New England, grouping only the largest and most important cities.

Bangor (21,850) has great advantages of situation. It lies far inland at the head of tide on the Penobscot,

Shipping at Bangor.

is surrounded by a broad extent of piedmont country, and receives from the upper basin of the river a vast amount of lumber.

Bangor makes boots and shoes, machinery, cheese and butter and a variety of lumber products. Great quantities of ice are annually taken from the river and shipped to many ports.

Calais (7655) is at the head of tide on the St. Croix.

Lumber and shoes are manufactured here. Calais has a foundry and machine shops, granite quarries and plaster mills. The raw plaster is brought from Nova Scotia.

Brunswick (6806), at the head of tide on the Androscoggin, is the seat of Bowdoin college, the oldest college in the state.

Ice Cutting in Maine.

Brunswick manufactures cotton goods, wood pulp and paper.

Ellsworth (4297), with fine water power, produces lumber and shoes. It has a shipyard and a large creamery.

Gardiner (5501) has fine water power from the Cobbosseecontee, which here falls into the Kennebec tide water.

Lumber, paper, pulp and machinery are manufactured. Ice is cut on the river.

The chief agricultural districts of the state are in the Aroostook valley (which comprises the largest area of fertile farming land in the state), and the piedmont belt, where the farms produce a large share of the food supplies for the neighboring towns and cities. Hay, potatoes, apples and dairy products are exported.

Far more valuable than the farm products, the fisheries or even the lumber forests are the manufactured products of the piedmont. Nearly all these manufactures come from cities and towns at waterfalls or rapids, chiefly in the southwestern part of the state, near the other New England states. It is in this open piedmont district, where population and manufactures are greatest, that the railroads have been chiefly built.

Lewiston (23,761), the second city in population and the second in manufactures, shares with **Auburn** (12,951) the sixty-foot falls of the Androscoggin.

Lewiston produces cotton and woolen goods, and lumber and planing mill products. It has a large bleaching and dyeing establishment.

Auburn is the leading city of the state in making boots and shoes. Among its other products are cotton goods, farming implements and carriages.

Rumford Falls, on the Androscoggin, has fine water power and is rapidly growing to be a leading center of manufacturing. It has immense paper mills. The river here descends 180 feet, in three falls.

Biddeford (16,145) and **Saco** (6122) share the lower falls of the Saco river.

Biddeford produces cotton goods, machinery, boots, shoes and lumber. Saco manufactures cotton goods, machinery, lumber and bricks.

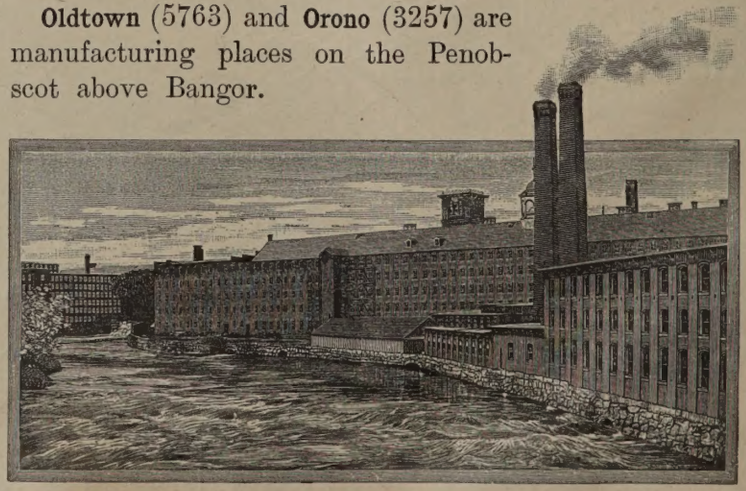
Westbrook (7283) is a manufacturing center near Portland.

The principal products of Westbrook are silk, cotton goods and paper.

Waterville (9477) and **Skowhegan** (5180) have water power on the Kennebec above Augusta.

Cotton and woolen goods, furniture and stoves are manufactured in Waterville; woolen goods, shoes, oilcloth, wood pulp, tools and lumber, in Skowhegan.

Oldtown (5763) and **Orono** (3257) are manufacturing places on the Penobscot above Bangor.



Cotton Mills at Saco.

Both deal extensively in lumber. Besides this, Oldtown has woolen mills. Orono has pulp and paper mills. In recent years the manufacture of wood pulp in all this region has greatly increased.

It is chiefly in the thickly settled piedmont district that the several colleges of the state are located, — Bowdoin being the only college close to the coast. Bates College is at Lewiston, Colby College at Waterville, and the University of Maine is located at Orono.

The rugged interior uplands, with their heavy forests, are more attractive to lumbermen than to farmers. As a whole, the northern part of the state is very thinly settled.

As small settlements are made in the forests, the people are too few and too scattered to have town governments. Such settlements are called *plantations*.

These forests supply not only lumber, but also bark for tanneries and wood for making pulp and paper.

The Connecticut river receives many side-streams that have worn deep valleys in the highlands on the east and the west. Its upper course is frequently broken by rapids. Farther down the valley, there are long smooth "reaches" between occasional rapids or falls.

Great numbers of logs are floated down the river, and many mills are driven by its falls. The entrance of side-streams often marks the place where villages have been built in the main valley.

The Merrimac has several falls. These, like many others in New England, are produced where the river has cut its channel down to rocky ledges. The falls afford great water power and determine the growth of important cities and towns.

The Androscoggin and the Saco drain the eastern and part of the southern slope of the mountain area, — thence flowing into Maine. The basin of the Androscoggin within New Hampshire is mountainous; that of the Saco in the same state is for the most part a broad sandy upland.

East of the Merrimac and south of Lake Winnepesaukee, the upland is of moderate height. Much of this district is covered with sandy drift left when the ancient ice-sheet melted back.

The short seacoast of New Hampshire is for the most part low and sandy. It is indented by only one estuary or drowned valley, — the Piscataqua.

What rivers flow into the tide water of the Piscataqua? Like the rivers of Maine, these streams have falls even in their lower courses.

The only outlying islands belonging to New Hampshire are four of the Isles of Shoals.

NEW HAMPSHIRE.

Physical Features.

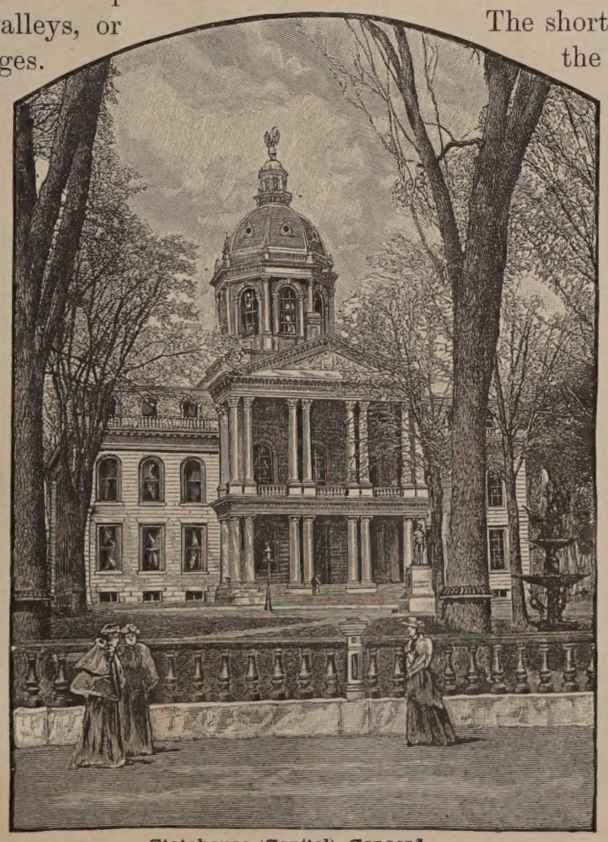
The White mountains, rising over the upland, are the most striking physical feature of New Hampshire. These mountains are divided by deep valleys, or *notches*, into several groups or ranges. The chief of these is the Presidential range. Mt. Washington is the highest summit.

The elevation in feet of the principal peaks is as follows: Washington, 6293; Adams, 5805; Jefferson, 5725; Clay, 5554; Monroe, 5390; Madison, 5380.

The Carter range is on the east of the Presidential; the Starr King group and the Pilot range are on the north; the Franconia range and the Moosilauke are on the west; and a number of smaller groups are on the south.

Southward from the White mountains, the plateau-like upland extends into Massachusetts with generally decreasing height. It descends on the west into the valley of the Connecticut; on the east into the valley of the Merrimac.

Several isolated mountains rise above the highland. Among these are Kearsarge (2943 f.) and Monadnock (3186 f.).



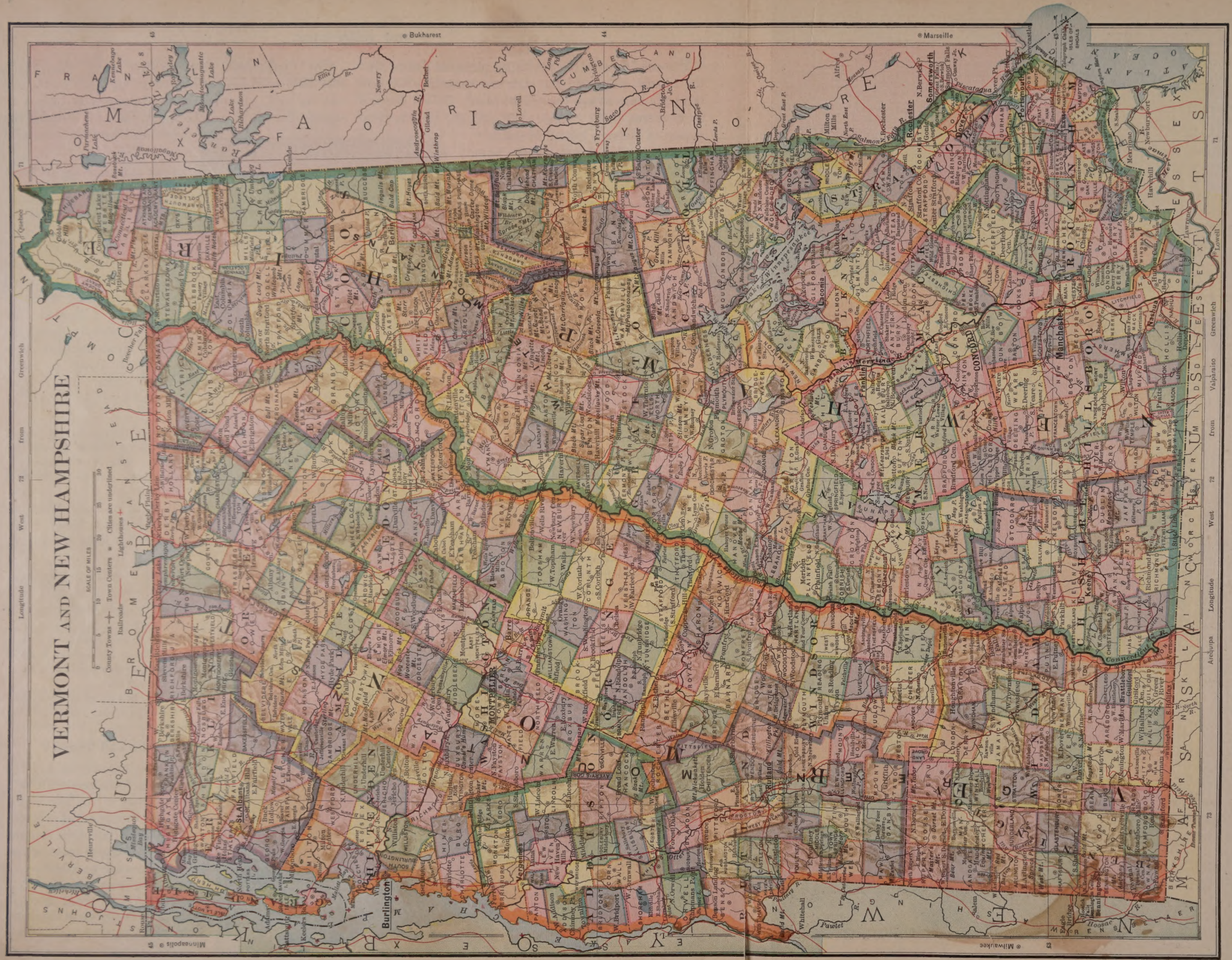
Statehouse (Capitol), Concord.

Cities and Towns.[1]

Owing to the shortness of the water front, **Portsmouth** (10,637), on the estuary of the Piscataqua, is the only important port in the state. New Hampshire is the only New England state whose largest city is not on a harbor.

The harbor of Portsmouth, — deep, capacious and rarely closed by ice, — has led to the establishment of a United States navy yard opposite the city, at Kittery, Maine.

[1] See footnotes on pages 9 and 11.

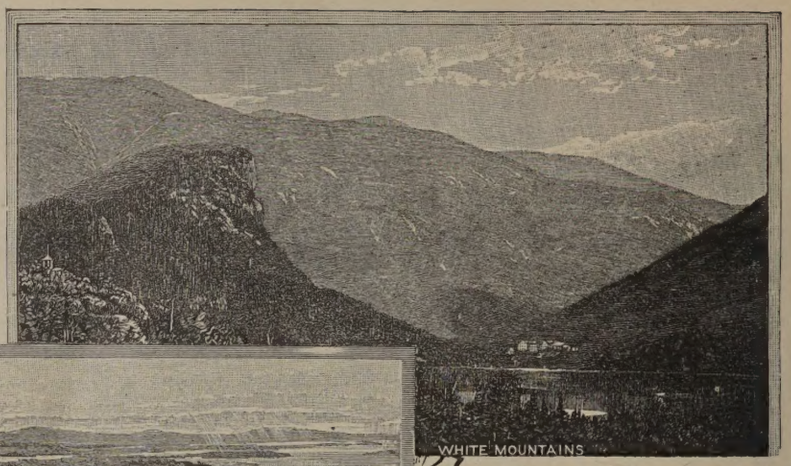

VERMONT AND NEW HAMPSHIRE
SCALE OF MILES
County Towns
Town Centers
Cities are underlined
Railroads
Lighthouses
Bukharest
Marseille
Milwaukee
Minneapolis
Burlington
Manchester
CONCORD
Rochester
Somersworth
Dover
Exeter
Portsmouth
Franklin
Laconia
Claremont
Keene
Nashua
Hanover
Littleton
Berlin
Lancaster
Colebrook
Whitefield
Woodsville
Bellows Falls
Brattleboro
Windsor
Springfield
Chester
Walpole
Newport
Lebanon
Plymouth
Wolfeboro
Meredith
Tilton
Northfield
Penacook
Hillsboro
Peterborough
Milford
Amherst
Merrimack
Hudson
Derry
Salem
Pelham
Windham
Londonderry
Goffstown
Weare
Deering
Henniker
Warner
Bradford
Newbury
Haverhill
Orford
Lyme
Canaan
Enfield
Grafton
Andover
Wilmot
Sunapee
Newport
Claremont
Walpole
Alstead
Marlow
Gilsum
Surry
Nelson
Sullivan
Roxbury
Stoddard
Hancock
Dublin
Jaffrey
Rindge
Fitzwilliam
Richmond
Swanzey
Winchester
Hinsdale
Chesterfield
Westmoreland
Walpole
Rockingham
Bellows Falls
Saxtons River
Putney
Dummerston
Brattleboro
Guilford
Vernon
Halifax
Whitingham
Wilmington
Dover
Readsboro
Searsburg
Stamford
Woodford
Bennington
Shaftsbury
Arlington
Sandgate
Manchester
Dorset
Rupert
Pawlet
Wells
Poultney
Castleton
Fair Haven
Hubbardton
Benson
Orwell
Shoreham
Whiting
Brandon
Pittsford
Proctor
Rutland
Wallingford
Mount Holly
Ludlow
Plymouth
Cavendish
Chester
Springfield
Weathersfield
Perkinsville
Ascutney
Windsor
Hartland
Cornish
Plainfield
Meriden
Lebanon
Hanover
Norwich
Thetford
Fairlee
Bradford
Newbury
Wells River
Groton
Peacham
Barnet
Ryegate
Corinth
Topsham
Bradford
Newbury
Haverhill
Piermont
Orford
Lyme
Dorchester
Wentworth
Rumney
Ashland
Holderness
Sandwich
Tamworth
Moultonborough
Ossipee
Wolfeboro
Alton
Barnstead
Gilmanton
Pittsfield
Chichester
Epsom
Northwood
Nottingham
Deerfield
Candia
Raymond
Fremont
Sandown
Danville
Kingston
Newton
Hampstead
Atkinson
Plaistow
Salem
Windham
Londonderry
Derry
Litchfield
Hudson
Pelham
Dracut
Tyngsboro
Dunstable
Nashua
Merrimack
Amherst
Mont Vernon
Lyndeborough
Wilton
Milford
Mason
Brookline
Hollis
New Ipswich
Temple
Peterborough
Sharon
Jaffrey
Rindge
Fitzwilliam
Troy
Marlborough
Harrisville
Dublin
Nelson
Stoddard
Hancock
Antrim
Bennington
Francestown
Deering
Weare
Goffstown
Bedford
Merrimack
Hudson
Litchfield
Nashua
Hollis
Brookline
Mason
Milford
Amherst
Mont Vernon
Lyndeborough
Wilton

Many years ago a dam was built across the river at Amoskeag falls, and water was led from the dam along the river bank, in canals which are now lined by large factories. On the west side of the river stands the largest steam-power cotton factory in the world.

These factories produce a great variety and quantity of cotton goods. About 10,000 operatives are employed; over 300 miles of cloth are made daily; and about $3,500,000 a year are paid in wages.

Other products of Manchester are boots and shoes, woolen goods, locomotives, fire engines, paper and machinery. The mill products especially are far-famed.

The State Industrial School is on the General John Stark Farm in Manchester.


WHITE MOUNTAINS

Lake Winnepesaukee.

Nashua (23,898) has water power from the Nashua river, which here enters the Merrimac.

This thriving city is noted for its manufactures of cotton. Its other products are iron goods, wooden and paper wares.

Laconia (8042), at the outlet of Lake Winnepesaukee, is a center of manufactures.

Laconia produces hosiery, woolen goods and railroad cars.

Franklin (5846) manufactures wood pulp, paper, machinery, woolen goods and hosiery. The neighborhood of Lakes Winnepesaukee and Sunapee are noted summer resorts.

The great forests of the northern part of the state yield much lumber. In recent years they have supplied a large amount of wood for pulp used in paper mills.

Berlin (8886) on the Androscoggin is the largest city in the northern part of the state and is rapidly growing. It has large sawmills and makes much paper for newspapers.

During the summer, visitors may be counted by thousands among the mountains. **North Conway, Bethlehem,** and some of the notches deep within the mountains, are well known resorts, attracting people from all parts of the country.

Dartmouth Hall, Hanover.

The rapid streams that descend east or west from the central highland have aided the growth of many manufacturing villages.

Keene (9165), on the Ashuelot, is the most important city on the western slope. The principal manufactures are lumber products, woolen goods and shoes.

Claremont (6498) and **Newport** (3126) are thriving towns on Sugar river. The manufactures of these towns are cotton and woolen goods, paper, machinery and shoes.

Hanover (1884) is the seat of Dartmouth college.

The rolling surface of the upland and the terraced floors of the Merrimac and Connecticut valleys contain many excellent farms on which dairying is an important business. Maple sugar is a valuable product of the upland districts.

Francestown (693), in the southern part of the highland, has soapstone quarries. **Grafton** (748), farther north, has mica mines.

VERMONT.

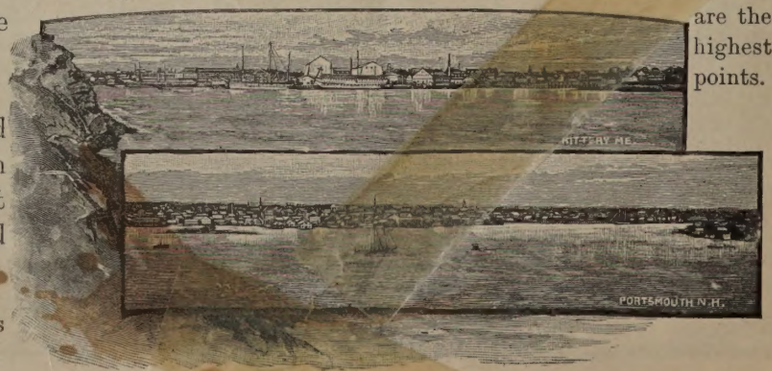
Physical Features.

The upland in Vermont is much broken by mountains that rise above it, and by valleys that are worn below it. The general elevation of the upland is from 1500 to 2000 feet. The Green mountains lie west of the middle line of the state.

The highest summits in feet are: Mt. Mansfield, 4364; Killington peak, 4241; Camels Hump, 4088; Jay peak, 4018.

West of the main range, and separated from it by deep limestone valleys, is the Taconic range. It lies chiefly in the southwestern part of the state and extends southward into Massachusetts. Its highest peaks are Mt. Equinox and Mt. Eolus.

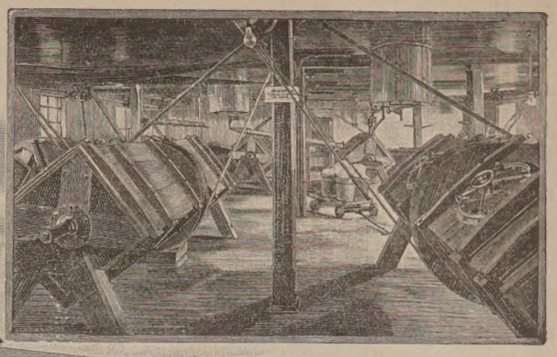
Further west, bordering on the lowland of the Great Valley, is a range of red sand-rock hills, of which Buck and Snake mountains are the highest points.

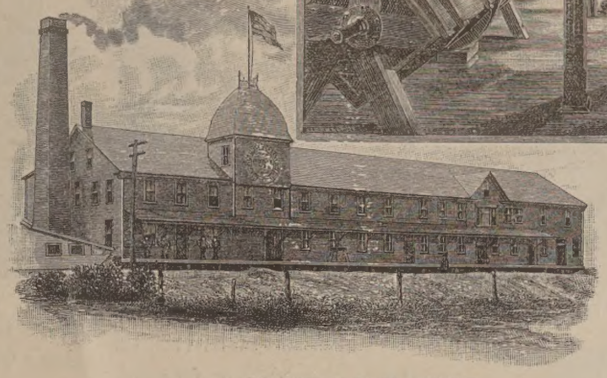

KITTERY ME.
PORTSMOUTH N.H.

The chief valleys of Vermont are those into which the upland descends on the east and the west. The Connecticut valley, by which the upland of New Hampshire is divided from that of Vermont, is a comparatively narrow depression following a belt of weak rocks and narrowing southward into Massachusetts. Many fine farms are found on its broad terraces.

The part of Vermont that borders on Lake Champlain lies in the Great Valley of the Appalachians, — here known as the Champlain valley. This lowland is a rich agricultural region.

There are no large lakes wholly within Vermont. The boundary between this state and New York runs along the deepest channel of Lake Champlain. The boundary between Vermont and Canada passes across Lake Memphremagog. The many headlands and islands of Lake Champlain recall the irregular coast of Maine.





Creamery at St. Albans.

Middlebury (3045), near the eastern side of the lowland, on Otter creek, produces marble. This town is the seat of Middlebury College.

Cities and Towns.[1]

Vermont has no seacoast, but its largest city, **Burlington** (18,640), has a fine harbor on Lake Champlain.

Granite Quarry, Concord, N.H.

Burlington has a large lumber trade, and uses great quantities of lumber for making boxes and house finishings. Patent medicines and cotton goods are among the important manufactures of this city.

The University of Vermont is located in Burlington.

Winooski, near Burlington, at a water power on the Winooski river, is an active manufacturing village.

St. Albans (6239) lies in the Great Valley, a little east of Lake Champlain. This town is in a rich agricultural region from which a large creamery receives milk to be made into butter and cheese. As much as twelve tons of butter can here be made in a day.

St. Albans has extensive railroad shops. Other industries produce farm machinery and bridges.

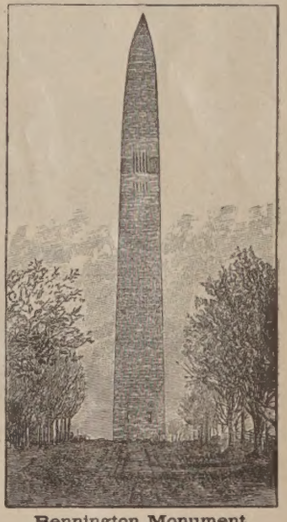
Vergennes (1753), the oldest city in Vermont, is on Otter creek, as far inland as vessels can ascend from the lake. This old city has fine water power. Horseshoe nails, curtain rollers, furniture, road machines and house finishings are here made.

Swanton (3745), at the head of navigation on the Missisquoi, has good water power and varied manufactures.

Rutland (11,499), the second city in population in the state, lies in the valley of Otter creek within the Green mountains. Its growth is chiefly due to its extensive marble works.

Rutland manufactures weighing scales, car wheels, farming implements, and steam boilers.

Marble is quarried chiefly at **Proctor** and **West Rutland.**

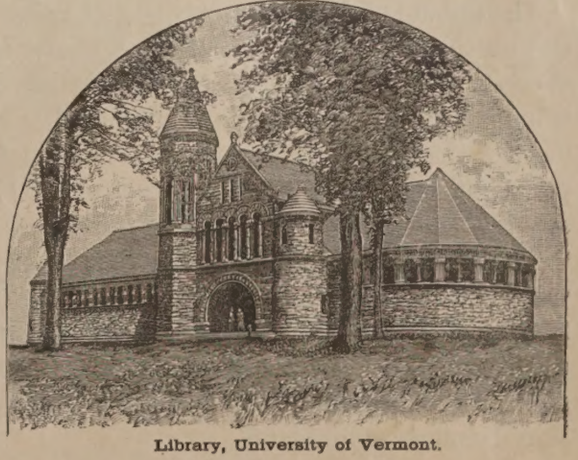


Bennington Monument.

Bennington (8033) lies in one of the valleys close to the southwestern corner of the state. Near here a famous battle of the Revolution was fought in 1777.

Bennington produces ocher and kaolin, and manufactures hosiery. The Soldiers' Home is in this town.

Entering farther into the upland that extends along the middle of the state, **Montpelier** (6266) is found in a central position, on the Winooski river. This city is important as the capital of the state, and is also engaged in manufacturing. Near **Barre** (8448) are extensive granite quarries. This city has in recent years made very rapid progress.



Library, University of Vermont.

St. Johnsbury (7010), in a branch valley of the Connecticut, has extensive works

[1] See footnotes on pages 9 and 11.

for the manufacture of weighing scales. **Newport** (3113), on Lake Memphremagog, has a large lumber trade and some manufacturing. It is a favorite summer resort.

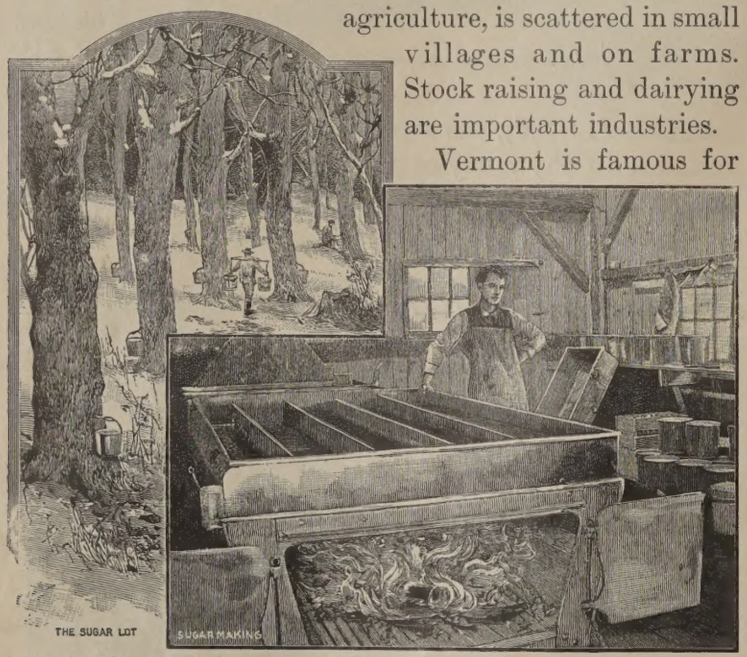
Descending the long valley of the Connecticut river, we find **Brattleboro** (6640), noted for its organ works and other manufactures.

Fort Dummer, the site of the earliest settlement of English-speaking colonists in Vermont, is a little south of Brattleboro.

At **Bellows Falls** (4337) the Connecticut descends in strong rapids. This fine water power is chiefly used in paper mills.

Windsor (2119) is a manufacturing town of historical interest. Here the first constitution of Vermont was framed, and the first legislature met.

A large share of the population of Vermont, engaged in agriculture, is scattered in small villages and on farms. Stock raising and dairying are important industries. Vermont is famous for its marble, and for its maple sugar and syrup. Lumbering employs many men on the forested uplands.



MASSACHUSETTS.

Physical Features.

The upland of Massachusetts has its greatest height in the northwest part of the state. The portion west of Worcester and the north course of the Nashua river belongs to the New England highland. Further east, most of the upland is lower and may be classed with the piedmont belt. The southeast part of the state is generally low and sandy and is part of the coastal plain.

The highland is divided by the broad Connecticut valley into two parts, — a western highland, about 1600 feet in elevation, the southern continuation of the Vermont highland; and an eastern highland, with an altitude about half as great. The latter is a continuation of the New Hampshire highland.

The Berkshire valley interrupts the highland near the western border of the state. The floor of this valley is about 1000 feet above the sea. It is inclosed on the west by the Taconic range, along which the state boundary line runs. The highest summits of the range are East mountain (2660 feet), Mt. Everett (2624 feet), Mt. Frizzell (2420 feet), Mt. Race (2395 feet).

Otter Creek and Killington Range.

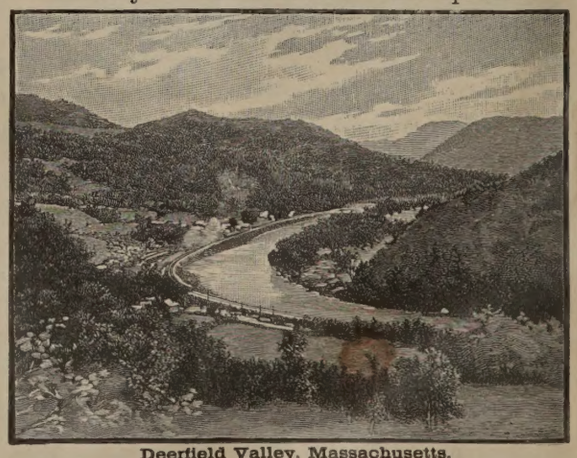
Greylock (3535 feet) is the highest mountain in the state. It rises from the floor of Berkshire valley. Hoosac mountain is a ridge along the border of the adjoining highland, and is noted for the tunnel that has been cut through it, joining the Deerfield and Hoosic valleys. Its highest summit is Spruce Hill (2588 feet).

Elsewhere, few mountains rise conspicuously over the highland. Remington mountain (2146 feet) on the western highland, and Mts. Grace (1628 feet), Watatic (1847 feet) and Wachusett (2108 feet) on the eastern highland, are the chief summits. The Blue hills (635 feet) rise near the margin of the piedmont area, about ten miles south of Boston. They have been taken by the state for a public park.

Name the chief branches of the Connecticut river in Massachusetts. By what river is the Berkshire valley drained? What large river enters Massachusetts from New Hampshire? How far is the adjacent state boundary from the eastward course of this river?

What river enters New Hampshire from Massachusetts? What river flows from Massachusetts into Rhode Island? What rivers flow into Boston harbor? Where is the Farmington river? — The Quinebaug? — The Sudbury? — The Concord? — The Ipswich? — The Taunton?

The western highland is deeply trenched by narrow valleys. Near the northern border of the state, the Deerfield valley is a thousand feet deep, although only a mile wide.



Deerfield Valley, Massachusetts.

The Connecticut valley is a broad lowland worn deep in the hard rocks of the highlands along a belt of relatively weak sandstone. At the northern border of the state, it is three miles wide and 200 feet above the

sea; at the southern border, it is twenty miles wide and about 100 feet above sea level.

The floor of the lowland is spread over with clays and sands, in which the river has cut a series of beautiful terraces.

A number of ridges consisting chiefly of slanting sheets of lava, or *trap*, surmount the lowland. The trap being much harder than the sandstone has not been worn down so low. The ridges slope to the east, but descend in steep bluffs to the west. Mts. Tom (1214 feet) and Holyoke (954 feet) are the highest.

The valleys of the eastern highland are wider and shallower, and are therefore much better suited for occupation than those of the western highland.

The piedmont area is a rolling hilly district of moderate elevation, much like southern Maine. In this region railroads diverge in all directions from Boston; while in the highlands, the railroads are few and are limited mostly to the valleys.

The coastal plain includes the southeastern part of the body of the state, with the peninsula of Cape Cod and the outlying islands. The peninsula and the islands consist chiefly of glacial moraines along the northern side, and plains of gravel and sand sloping gently to their southern side. Near the end of Cape Cod are many sand dunes.

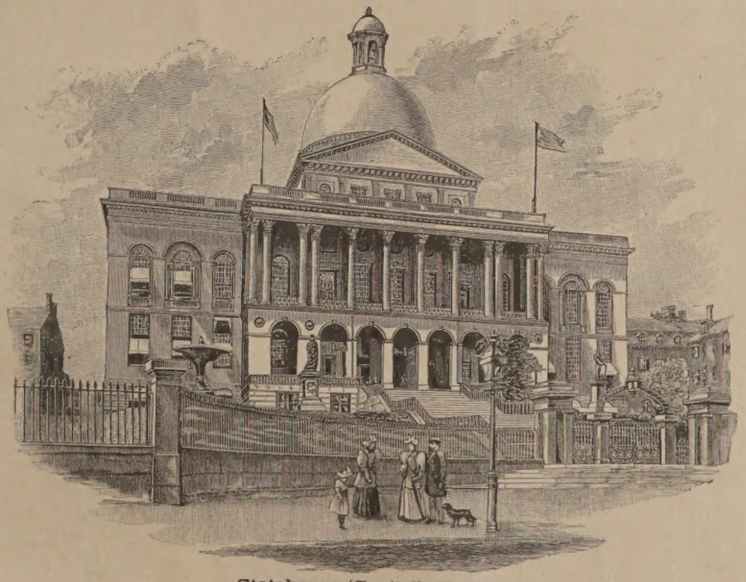
The coast of Massachusetts is of more varied character than that of any other New England state. The peninsula of Cape Ann is a rocky headland. Further north are the long wave-built sand bars of Plum island and Salisbury beach, behind which are extensive marshes from one to fourteen miles wide.

From Cape Ann to Lynn, the coast is bold and rocky and is occupied by many beautiful summer residences. Salem harbor is a drowned valley. Boston harbor is the drowned part of the Boston basin, — a lowland within the hilly piedmont area between Lynn, Waltham and Quincy. Many of the harbor islands are drumlins.

The peninsulas of Nahant, Winthrop and Nantasket were once islands. They are now attached to the mainland by sand bars and tidal marshes. Long sand bars, inclosing tidal marshes, skirt the coast from Scituate to Plymouth. At the latter place the harbor is inclosed by a sand spit. Some of the marshes have been reclaimed by diking, and are used as farm land.

A high sandy cliff has been cut in the hills of Manomet. Sand bars and marshes fringe the greater part of Cape Cod bay. Most of the "back" or eastern side of the peninsula of Cape Cod has been cut by the heavy ocean waves into a long, nearly straight sandy cliff, continued by sand bars northward to Provincetown, and southward in Nausett beach and the low island of Monomoy.

The exposed sides of Nantucket and Marthas Vineyard are made smooth by the ocean waves; but Buzzards bay, protected from the open sea, still has an irregular shore line.

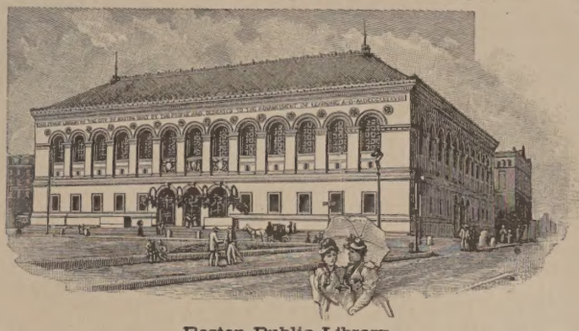


Statehouse (Capitol), Boston.

Strong tidal currents sweep through the narrower parts of Nantucket and Vineyard sounds.

Cities and Towns.[1]

Massachusetts has the largest population and the greatest wealth, though not the largest area, of any New England state.



Boston Public Library.

Boston (560,892), the capital of Massachusetts and the largest city in New England, lies on one of the most beautiful harbors of the Atlantic coast. Since adding western railroad connections to the advantages of the harbor, it has grown so rapidly that a large part of the city proper is built on "made land," where the shallow tidal basins have been filled with gravel.

Besides Boston proper, the city limits include East Boston, Charlestown, Roxbury, Brighton, Dorchester, South Boston and many villages on the south and southwest and up the valley of the Charles river. Boston is a noted center of music and literature. It is the seat of the Institute of Technology, Boston University and Boston College. Printing and publishing is the great industry.

It is the fifth city in the United States in the value of its products. It has large dealings in wool and leather, as well as in manufactured articles of New England mills and shops. Many wealthy banks, and the offices of many western railroads and mining companies, are established in this city. A large coasting and foreign trade is carried on from this port. It is a great provision market. The product of refined sugar is very large. Other products are clothing, iron wares, machinery, boots and shoes and rubber goods. Its coastwise imports are coal, lumber, fish, lime and building stone. Its foreign imports are chiefly manufactured articles from Europe. Its exports are provisions, cattle, cotton and leather. More than half of these go to Great Britain.

Closely surrounding Boston lie a number of cities and towns, the seat of various industries and the residence of many persons whose business is in the great city. Thus, about half the population of the state is gathered within about fifteen miles of the statehouse. These surrounding places and their characteristics may be briefly described as follows:

[1] See footnotes on pages 9 and 11.

MASSACHUSETTS

SCALE OF MILES
0 5 10 15 20
County Towns ⊕ Town Centers Cities are underlined
Railroads Lighthouses Lightships

REFERENCE TABLE

SHOWING GROWTH OF THE THIRTY-FIVE LARGEST NEW ENGLAND CITIES.

Cities:	*1900*	*1890*
Boston	560,892	448,477
Providence	175,597	132,146
Worcester	118,421	84,655
New Haven	108,027	81,298
Fall River	104,863	74,398
Lowell	94,969	77,696
Cambridge	91,886	70,028
Hartford	79,850	53,230
Bridgeport	70,996	48,886
Lynn	68,513	55,727
Lawrence	62,559	44,654
New Bedford	62,442	40,733
Springfield	62,059	44,179
Somerville	61,643	40,152
Manchester	56,987	44,126
Portland	50,145	36,425
Waterbury	45,859	28,646
Holyoke	45,712	35,637
Brockton	40,063	27,294
Pawtucket	39,231	27,633
Haverhill	37,175	27,412
Salem	35,956	30,801
Chelsea	34,072	27,909
Malden	33,664	23,031
Newton	33,587	24,379
Fitchburg	31,531	22,037
Taunton	31,036	25,448
Woonsocket	28,204	20,830
Gloucester	26,121	24,651
New Britain	25,998	16,519
Everett	24,336	11,068
Meriden	24,296	21,652
North Adams	24,200	16,074
Quincy	23,899	16,723
Nashua	23,898	19,310

Cambridge (91,886) is the seat of Harvard University. Book printing is an important industry in this city.

Lynn (68,513) has for years been famous for its boot and shoe factories. Its present rank is second in the Union. There are large electrical works in this city.

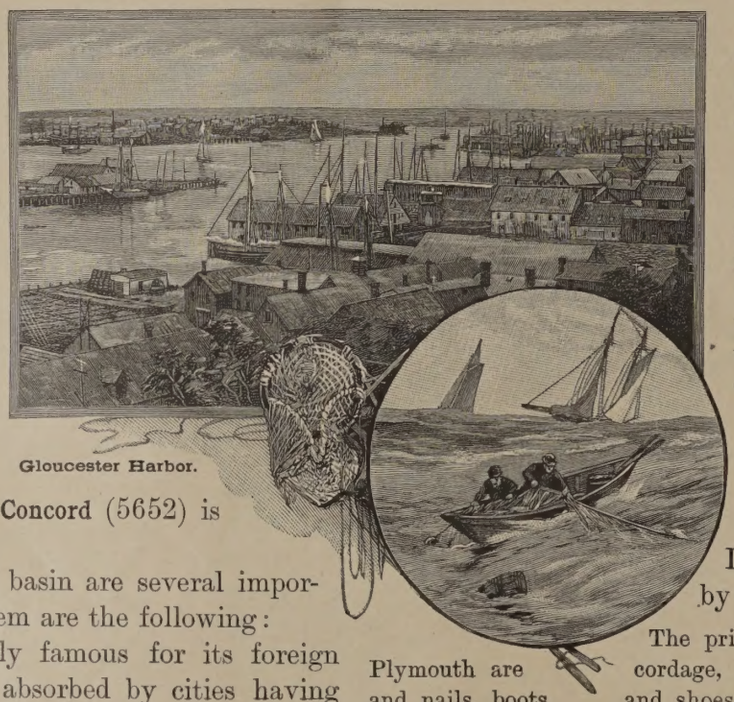
Somerville (61,643) has large works for meat packing. Its manufactures have had a very rapid growth. Tufts College is located partly in this city and partly in **Medford** (18,244).

Chelsea (34,072) manufactures rubber goods, boots and shoes and furnaces. **Stoneham** (6197), **Melrose** (12,962), **Wakefield** (9290) and **Weymouth** (11,324) are thriving towns.

Newton (33,587), **Brookline** (19,935), **Everett** (24,336), **Dedham** (7457) and **Milton** (6578) are favorite residential suburbs, famous for their beautiful homes.

Malden (33,664) and **Quincy** (23,899) manufacture leather. Quincy is also famous for its granite quarries, and Malden for its rubber works.

Waltham (23,481) has the largest watch factory in the world. **Woburn** (14,254) has large tanneries. **Hyde Park** (13,244) manufactures cotton goods and tools. **Watertown** (9706) contains a United States arsenal. **Arlington** (8603) and **Belmont** (3929) carry on market gardening. **Concord** (5652) is famous for its early history.



Gloucester Harbor.

Northward from the Boston basin are several important coastal cities. Among them are the following:

Salem (35,956) was formerly famous for its foreign commerce, but this has been absorbed by cities having direct connection with the interior states of the Union. It has many manufactures, among them shoes, leather, white lead, cars. It imports coal.

Beverly (13,884) manufactures boots and shoes. **Peabody** (11,523) makes leather and carriages. **Danvers** (8543) is the seat of a great asylum for insane people.

Gloucester (26,121), on an excellent harbor near Cape Ann, is the leading fishing port of the country. Many vessels go to the Newfoundland or to Georges banks for cod and halibut. There is a large fish preserving industry here.

Marblehead (7582) is a fishing port with a good harbor. It is a noted yachting resort in summer.

Rockport (4592), near Gloucester, has large granite quarries. The stone is shipped mostly by sea.

Newburyport (14,478) is a manufacturing city. A shoal at the mouth of the Merrimac greatly lessens the value of the river to the cities on its lower course.

Among the products of Newburyport are cotton and woolen goods, boots and shoes and machinery.

The tidal channels in the salt marshes about **Ipswich** (4658) and **Essex** (1663) yield clams in large quantities.

Haverhill (37,175) has, after Brockton and Lynn, the largest product of boots and shoes in America. **Amesbury** (9473) is noted for its carriage shops.

Fall River (104,863), the chief city of southern Massachusetts and the greatest cotton-spinning city in America, has far outgrown the water power from Watuppa pond, on which its mills at first depended. Steam power is now largely used in the mills.

Besides the cotton mills, there are large bleaching, dyeing and calico-printing works. Large quantities of coal and cotton are brought into Fall River. It has the advantage of being on an important line of travel by rail and steamboat between Boston and New York.

New Bedford (62,442), on a well-protected harbor on Buzzards bay, has large cotton mills.

This city produces also shoes, machinery and a great variety of other goods. New Bedford was formerly the leading port of the whale fishery; but since the development of petroleum wells, the whaling industry has greatly decreased. At present New Bedford and San Francisco maintain small whaling fleets.

Plymouth (9592) is interesting from its early history. Its coasting trade is restricted by the shallowness of its harbor.

The principal manufactured products of Plymouth are cordage, cotton and woolen goods, tacks and nails, boots and shoes.

South of Plymouth and east of **Middleboro** (6885), cranberries are raised in large quantities. **Wareham** (3432) deals largely in oysters gathered from Buzzards bay.

The people of Cape Cod peninsula are chiefly occupied in fishing and agriculture. Cranberries are here an important crop.

Sandwich (1448), **Barnstable** (4364) and **Provincetown** (4247) are the chief places on "the Cape." Many men from these towns are employed in the coasting trade, as well as in fishing.

Cottage City is a favorite summer resort. **Vineyard Haven** is an important harbor for coasting vessels. **Nantucket** (3006) was formerly a leading port for whalers. Both Cape Cod and the outlying islands are visited in summer by many persons from the interior. Steamboats connect the islands with Woods Hole and New Bedford.

In the southeastern part of the piedmont area, **Taunton** (31,036), at the head of tide water of Taunton river, is the most important city. It has varied manufactures.

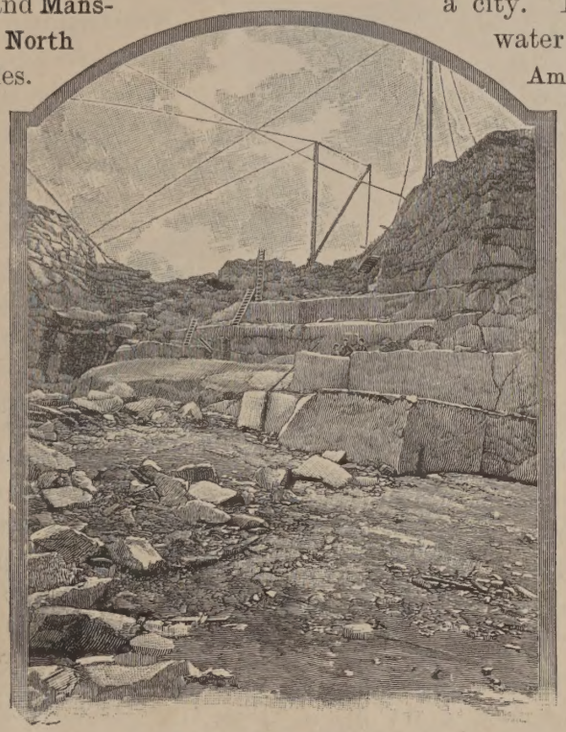
Among the products of Taunton are cotton, boots and shoes, brass ware, machines, tools, locomotives, tacks and nails.

Brockton (40,063) is now the leading city in the United States in the manufacture of boots and shoes. Several neighboring villages take part in the same industry.

North Easton (Easton has 4837 population) makes agricultural implements. **Attleboro** (11,335) and **Mansfield** (4006) manufacture jewelry. **North Attleboro** (7253) is a hive of industries.

In the Northern piedmont district, **Lowell** (94,969) is the chief city. Here the falls of the Merrimac were dammed about three fourths of a century ago. Canals were constructed on the southern side of the river, and they are now lined with great factories. Cotton goods are the most important product.

Other important manufactures are woolen goods, foundry and machine wares, patent medicines, worsteds, hosiery, leather, boots and shoes.



Granite Quarry, Quincy.

At **Lawrence** (62,559) the rapids of the Merrimac were dammed over fifty years ago, and canals were built along both sides of the river. The chief product of the great mills is now worsted goods. Their cotton has long been famous. There are paper and flour mills, foundries and machine shops.

The slack water above the dam at Lowell reaches almost to Nashua, and the slack water above Lawrence reaches to Lowell; hence no new water-power cities can be built between these cities. As at Manchester, Fall River and elsewhere, the mills are so extensive that steam is now largely used to supplement the water power.

Worcester (118,421) lies in the valley that may be taken to separate the piedmont area from the eastern highland. It is an important railroad center and contains a large number of factories and machine shops.

In the working of iron and steel, Worcester is the leading city of the state. It has the largest wire mills in the country. Weaving machinery and a great variety of foundry and machine products are also made here. The city is an important center of trade for many surrounding factory towns. It is the seat of Worcester Polytechnic Institute, Clark University and Holy Cross College.

Eastward from Worcester, the piedmont area contains many busy towns, — among them the following:

Marlboro (13,609, a city), **Natick** (9488), **Milford** (11,376), **Westboro** (5400), **Hopkinton** (2623), **Hudson** (5454), **Ashland** (1525), of which boots and shoes may be named as the leading product; **Clinton** (13,667), noted for carpets; **Framingham** (11,302), **Foxboro** (3266) and **Wrentham** (2720), where straw goods are an important product. **Blackstone** (5721), near the spinning district of Rhode Island, produces cotton goods. Market gardening and dairying are important industries in this thickly settled district.

The highland east of the Connecticut river contains a number of manufacturing centers, generally situated in the valleys; but only one, **Fitchburg** (31,531), has become a city. This city is in a narrow valley at a water power of the Nashua river.

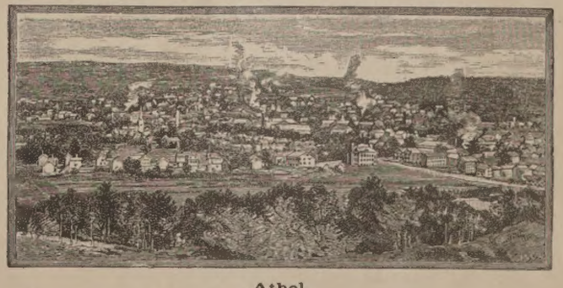
Among the varied products of Fitchburg are cotton goods, worsteds, paper, machine and foundry wares and planing mill products. Granite is quarried on Rollstone hill.

On the eastern highland are many farms yielding hay, dairy products, livestock, poultry and fruit. The forests supply some lumber, but more is brought from the north to the factories making furniture, boxes and wooden ware.

Gardner (10,813) and **Templeton** (3489) on the upland, have large chair factories. **Athol** (7061) and **Spencer** (7627) have boot and shoe shops. **Orange** (5520) produces sewing machines and wooden ware. **Millers Falls** makes tools. **Webster** (8804) has cotton and woolen factories and boot and shoe shops. **Southbridge** (10,025) manufactures spectacles, eye glasses and shoe knives. An important granite (gneiss) quarry is worked south of **Palmer** (7801). **Leominster** (12,392), **Montague** (including Turners Falls) and **Ware** (8263) have a variety of manufactures.

The broad Connecticut valley is one of the most attractive parts of the state. It has a milder climate and better soil than the highland, and was early settled by colonists from the coast.

Springfield (62,059) is the chief city in the district. It is an important railroad and trade center, and the seat of a United States arsenal.



Athol.

The chief products of Springfield are cars, locomotives, machinery and tobacco and paper wares. Large sandstone quarries are worked at Longmeadow near by.

Westfield (12,310), on the Westfield river, has a variety of manufactures.

Chicopee and **Chicopee Falls** (19,167) use the strong water power of the Chicopee river, where it has cut down through the terrace plain to the sandstone ledges beneath.

The factories here make cotton goods, bicycles, swords, knitting machines and agricultural tools.

Holyoke (45,712) is a manufacturing city of remarkable growth since the rapids of the Connecticut river were here dammed. This is a leading city of the Union in the production of paper.

Jewelry Factory, Providence.

Other products of Holyoke are cotton and woolen goods, cutlery and machinery.

Northampton (18,642) is an old settlement near Mts. Tom and Holyoke, in the midst of a rich agricultural district. It is the seat of Smith College for young women.

Including the villages of **Florence** and **Leeds,** on water power of Mill river, the products are silk, cutlery, oil stoves, mirrors and emery wheels.

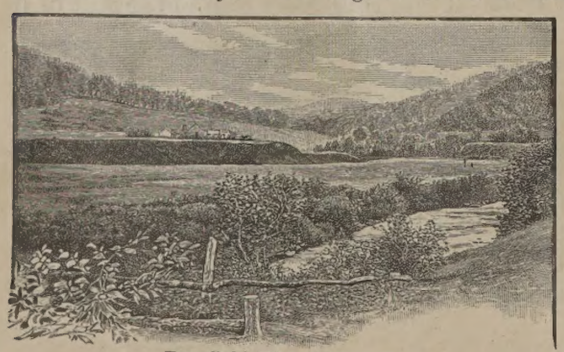
Amherst (5028), in the eastern part of the valley, is the seat of Amherst College and the State Agricultural College.

Greenfield (7927) is an important railroad junction.

The western highland is the most thinly settled region in the state. Its upland farming villages are small and isolated. Hay and fruit from the farms, lumber from the forests, wooden ware, wood pulp, carriages and wagons from the factories, are the chief products of the district.

Shelburne Falls (1508) produces cutlery, hardware, silk and shoe pegs. **Chester** (1450) has valuable emery works.

The eastern and western highlands are crossed by two important lines of railroad, which connect with western roads in the Hudson and Mohawk valleys. The highest levels of these roads on the eastern highland are a little less than 1000 feet at Charlton (1860), and a little more at Gardner. The southern line (Boston and Albany) crosses the western highland by ascending the long grade of Westfield valley and its branches to Washington, and then descending to Pittsfield. The northern line (Fitchburg) follows the deep Deerfield valley to its elbow, and then passes under Hoosac mountain by way of a tunnel four and three fourths miles long, costing $20,000,000.



Deerfield River Terraces.

North Adams (24,200) has excellent water power and in recent years has grown very rapidly.

The principal products of North Adams are cotton and woolen goods, boots and shoes.

Adams (11,134) produces cotton and woolen goods and paper.

Williamstown (5013) is the seat of Williams College.

Pittsfield (21,766) has a variety of manufactures, woolen goods being the most important. The city is in the midst of a rich agricultural district. Limestone is quarried at several points in the Berkshire valley.

RHODE ISLAND.

Physical Features.

Along the northern boundary of the state, the upland has a height of from 400 to 600 feet. Thence it descends gradually southward to the coast. Much of the surface is wooded.

No part of the state is mountainous, but there are several hills which rise somewhat above the general level and thus correspond on a small scale to such mountains as Monadnock and Kearsarge in New Hampshire. The highest of these is Durfee hill (805 feet); next come Jerimoth hill (799 feet) and Benson hill (794 feet).

Turners Falls, Massachusetts.

The upland is much worn by streams whose open valleys are from 200 to 300 feet deep near the northern border, but much shallower in the south.

The most striking feature of the state is the broad branching valley near its eastern side, now partly drowned and forming Narragansett bay. This is one of the most beautiful arms of the sea indenting the New England coast.

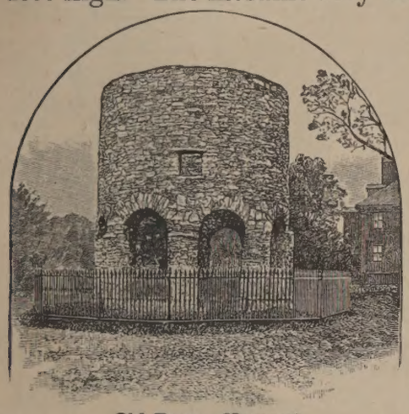
The Blackstone river enters Rhode Island from Massachusetts, turning many mill wheels on the way. It is called the Seekonk and Providence rivers successively in its lower course, where it broadens at the head of the bay.

The Taunton river carries tide water into Massachusetts. The arm of the sea called Sakonnet river is a drowned valley of smaller size than that which formed Narragansett bay.

The Pawtuxet river flows wholly within Rhode Island. It has many lakes, swamps and falls on its course.

The hills that rose above the ancient valley floor, before Narragansett bay was formed, now stand as islands above its waters. The largest of these are Aquidneck or Rhode island, Conanicut island and Prudence island.

Near the southern coast, west of the rocky headland of Point Judith, from Wakefield to Watch Hill, there is a well-marked glacial moraine. It consists of a range of gravel hills, one or two miles wide and from 100 to 200 feet high. The moraine may be traced westward through Fishers and Plum islands, to the northern hills of Long Island.



Old Tower, Newport.

The moraine near the southern coast forms a barrier in front of several streams that descend from the upland. They gather back of the moraine, in swamps and ponds, overflowing westward by the Pawcatuck river which enters Fishers Island sound.

The greatest battle of King Philip's war was fought at an Indian town near South Kingston, in this marshy district. About one thousand Indians were killed there.

The bars along the southern coast, inclosing shallow lagoons, are like those of much greater length in North Carolina. No harbors and only a few villages are found on this low and exposed part of the coast. It is much less useful than the sheltered shores of the bay.

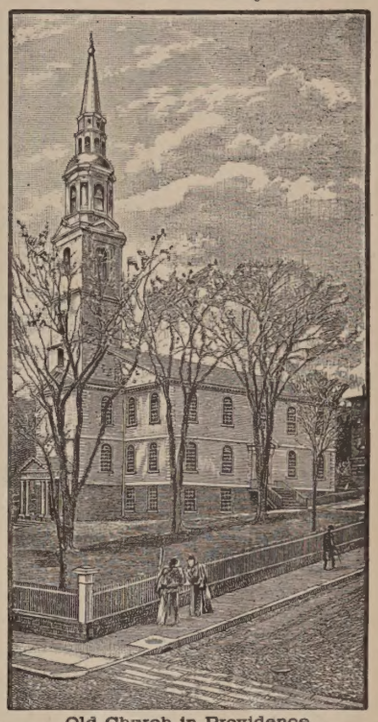
Cities and Towns.[1]

The whole of Rhode Island is in the piedmont belt, where manufacturing cities and villages are numerous. Its population is therefore denser than that of any other state in the Union. It averages 407 people to the square mile; but if an equal area of eastern Massachusetts or southern New York were taken, a still denser population would be found.

A large part of the state is cleared of forest and is under cultivation, but agriculture is of small importance compared with manufactures. The chief value of the farms is in supplying garden and dairy produce to the cities and towns. The staple articles of food, — meat and flour, — come from the Western states.

Providence (175,597), the capital of the state, stands nearly at the head of the bay. This position is so advantageous to its own industries, as well as to its service as a port of shipment for many interior cities and towns, that it has grown to be next to the largest city of New England.

Providence has the further advantage of being somewhat nearer New York than many busy cities of eastern New England. It is therefore in the pathway of active traffic. Many railroads connect the city with interior points. Steam and sailing vessels carry manufactured products to New York and other ports, and bring coal, cotton, wool, iron and grain in return.



Old Church in Providence.
Built in 1772 or 1773.

The manufactures of Providence are varied. The most important are worsteds, woolen and cotton goods, silver ware, jewelry, locomotives, machinery, tools and screws. Many factories in which these goods are produced are either the largest or among the largest of their kind in the country. Their products hold high rank as standard articles. The largest screw factory in the world and the largest jewelry works in America are in this city.

Providence is the seat of Brown University.

Newport (22,034), the most noted seaside resort in the United States, lies on an island in the outermost well-protected harbor of Narragansett bay.

Until November 6, 1901, Newport was one of the capitals of the state. For a long time, the chief importance of the city came from its fisheries. It is still important in this respect, — its inner harbor being often filled with fishing schooners; but it is now more famous as a summer resort.

View of Providence.

A United States naval training station, torpedo station, and naval war college are established here. The "stone mill" of Newport has been by many persons regarded as a relic of the early Norsemen;

[1] See footnotes on pages 9 and 11.

CONNECTICUT AND RHODE ISLAND

SCALE OF MILES

0 5 10 15 20

County Towns — Town Centers • Villages ○

Railroads — Steamboat Lines — Lighthouses +

Boroughs are shown in this type **Greenwich**

Lightships — Cities are underlined

Electric Roads

STEAMBOAT ROUTE FROM N.Y. TO FALL RIVER 182 NAUTICAL MILES

STEAMBOAT ROUTE FROM FALL RIVER TO N.Y. 152 NAUTICAL MILES

Longitude West from Greenwich

Montreal 73°30′ 73° Montpelier 72°30′ 72° 71°30′ Quebec

Arequipa 73°30′ 73° 72°30′ Valparaiso 72° 71°30′

Chicago 42° 41°30′ Rome 42° 41°30′

Constantinople 41°

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but it is now believed to have been built for a windmill, by one of the early New England colonists.

Warwick (21,316) is noted for the manufacture of cotton goods.

Bristol (6901) has a good harbor on a branch of the bay, and is noted for boat building. Rubber, woolen and cotton goods are here manufactured.

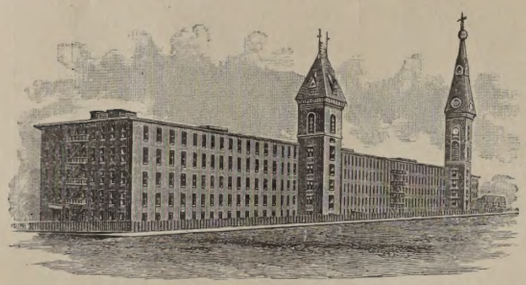
East Providence (12,138) has chemical and electrical works.

Warren (5108) manufactures cotton goods.

Summer Residence, Newport.

North Kingstown (4194) has large woolen mills. **South Kingstown** (4972) contains a number of manufacturing villages. **East Greenwich** (2775) has varied manufactures. **Tiverton** (2977) manufactures fish oil and fertilizers.

Portsmouth (2105) formerly produced a small amount of anthracite coal. **Jamestown** and **Narragansett Pier** are well known summer resorts.



A Rhode Island Cotton Mill.

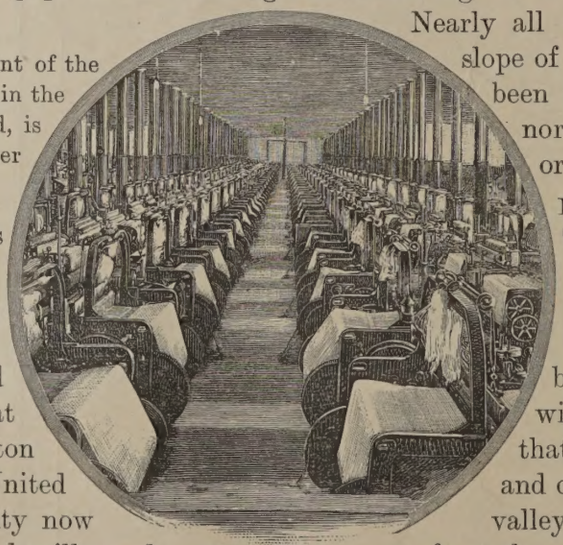
Fishing is carried on from many villages on the bay. Oysters, clams and scallops are gathered in large quantities.

Westerly (7541) is the only important port outside Narragansett bay. It has extensive granite quarries, as well as cloth and thread mills. Printing presses are among the products of Westerly.

Watch Hill, a summer resort on a point of the moraine, is the most western settlement in the state. New Shoreham, on Block island, is engaged in fisheries and has many summer visitors.

The interior manufacturing cities and towns are chiefly located at falls of the Blackstone and Pawtuxet rivers and their branches.

Pawtucket (39,231) is the second city of the state in size. Here at falls of the Blackstone, the first cotton mill worked by water power in the United States was built in 1790. The city now has large cotton, worsted and thread mills, and extensive bleaching, dyeing and print works.



Cloth Weaving, Rhode Island.

Woonsocket (28,204), on both sides of the Blackstone, near the state line, produces cotton, worsted and woolen goods and machinery. **Central Falls** (18,167) and **Lincoln** (8937) are noted for their great cotton and woolen mills.

Many villages in the following towns are actively engaged in manufacturing: **Johnston** (4305), woolen goods; **Cranston** (13,343), bleaching, dyeing, print works and safe works; **Cumberland** (8925), various manufactures; **Burrillville** (6317), woolen goods; **Coventry** (5279), cotton and woolen goods.

CONNECTICUT.

Physical Features.

The general upland of New England descends with much regularity from the northern boundary of Connecticut to the coast.[1]

The elevation of the upland near the northwest corner of the state is about 1500 feet; near the northeast corner about 500 feet. The higher northern part of the upland may be classed with the New England highland; the lower southern part with the piedmont belt. No distinct boundary is drawn between these regions in this state.

Connecticut Upland.

Few mountains rise above the general level of the upland. Of these the highest is Bear mountain (2355 feet), a member of the Taconic range in the northwest corner of the state.

Nearly all the streams follow the southward slope of the upland, and many valleys have been worn beneath its surface. In the northwest, a number of valleys are 500 or 600 feet deep.

Few streams in this state flow northward. The north bend of the Farmington river, and the Still river by Danbury, are almost the only examples of the kind.

The most important lowland is the broad valley, fifteen to twenty miles wide, following the belt of red sandstone that enters the state from Massachusetts and continues south to New Haven. This valley is well inclosed by strong slopes from the eastern and western uplands.

The lowland is diversified by trap ridges like those of Massachusetts. The best known are East Rock (359 feet) and West Rock (400–700 feet) near New Haven; the Hanging hills (1007 feet) by Meriden; the Talcott mountain (965 feet) west of Hartford.

[1] No portion of the true coastal plain is in this state.

The sandstone lowland is very generally spread over with glacial drift, making an excellent surface for farming. The drift is sometimes in the form of drumlins, as near Durham; sometimes in broad plains of clay and sand, in which the streams have cut terraces, — those of the Scantic being well marked.

The Connecticut river follows the valley lowland east of the trap ridges as far as Middletown; but there enters a narrow steep-sided valley which leads it through the eastern upland to the sound at Saybrook.

The chief tributary of the Connecticut in this state is the Farmington. This stream issues from a deep and narrow valley in the western upland, turns north at Farmington along the lowland west of the trap ridges, crosses the range in a narrow gap at Tariffville, and then terraces the drift plain on the way to the main river at Windsor.

The principal stream of the southern part of the lowland is the Quinnipiac, which flows through extensive tidal marshes at the head of New Haven bay.

The southern extension of the Berkshire valley of Massachusetts makes an important valley in northwest Connecticut. Its floor is about 800 feet above sea level.

This valley is drained by the Housatonic. The river leaves the open valley at Falls village and pursues a narrow and deep valley through the upland to the sea. The largest tributary of the Housatonic is the Naugatuck. Both these streams, like most others in the upland, have numerous falls.

The chief river of the eastern part of the state is the Thames, formed by the union of the Yantic and Shetucket. The Pawcatuck and Byram are small rivers, making parts of the east and west boundaries of the state.

The sinking of the uneven upland, by which the irregular coastline of New England is produced, is of less amount in the south than in the north; hence the coastal bays are not so long in Connecticut as in Maine.

Many small harbors indent the shore between projecting headlands of Connecticut, and most of the rivers are tidal for several miles inland. Numerous small rocky islands fringe the coast.

New Haven Harbor.

The original size of many shallow bays has been lessened by delta plains of clay and sand, formed when the ice-sheet of the glacial time was melting away. Smooth fields of great value were thus formed along the coast, as those near Saybrook, Norwich and elsewhere. New Haven bay, formed by the drowning of the southern part of the sandstone valley, was much shortened in this way. The delta clays are now used for brick making.

The Thames is a beautiful example of a drowned valley, having navigable water and tides fifteen miles inland. The Connecticut has slight tides as far up as Hartford, about forty miles from its mouth. Vessels of light draft can ascend to the capital city. The Housatonic is navigable to small vessels for twelve miles inland.

The sheltered waters of Long Island sound are of great service in coastwise navigation. The tides here have a moderate rise and fall, generally about six feet. Between Fishers and Gull islands, at the east end of the sound, tidal currents flow actively, giving this channel the name of "the Race."

Firearms Manufactory, Hartford.

Fish, oysters and clams are important products of the sound. Shad are taken at certain seasons from the tidal rivers, especially from the Connecticut.

Cities and Towns.[1]

Connecticut was originally an agricultural and trading colony, but it now ranks high among the manufacturing states. The great increase in the population and wealth of Connecticut has resulted largely from the remarkable inventive ingenuity and business enterprise of its people.

The situation and natural features of the state have in many ways been most helpful to its growth. The falls on its streams supply excellent water power; and as many of the falls are in the lower course of the streams, the factories frequently have the double advantage of large water volume and situation near the coast.

The numerous harbors promote coasting trade. Many steamboats and sailing packets ply between the ports on the sound and New York city, carrying out manufactured products and bringing in coal, iron and grain. The shortness of the distance to New York is very beneficial. Many manufacturing companies have salesrooms in that metropolis.

The growth of varied industries has brought many persons to work in this state. Thousands of immigrants have therefore found a home here. With increasing population, market gardening and dairying have become more profitable, — especially in the southern and western parts of the state. Much tobacco is raised.

An extensive system of railroads has been developed, connecting all the larger cities and towns with one another.

One important railroad follows the coast, forming a main line between Boston and New York. Other lines ascend the valleys towards the interior, or even pass northward into Massachusetts. A few lines cross the upland east and west from valley to valley; but these have the disadvantage of steep grades.

[1] See footnotes on pages 9 and 11.

New Haven (108,027), the largest city in the state, lies on the bay that reaches farthest inland. It is at the coastal end of the great Connecticut valley by which communication is most easily held with the interior.

New London Harbor.

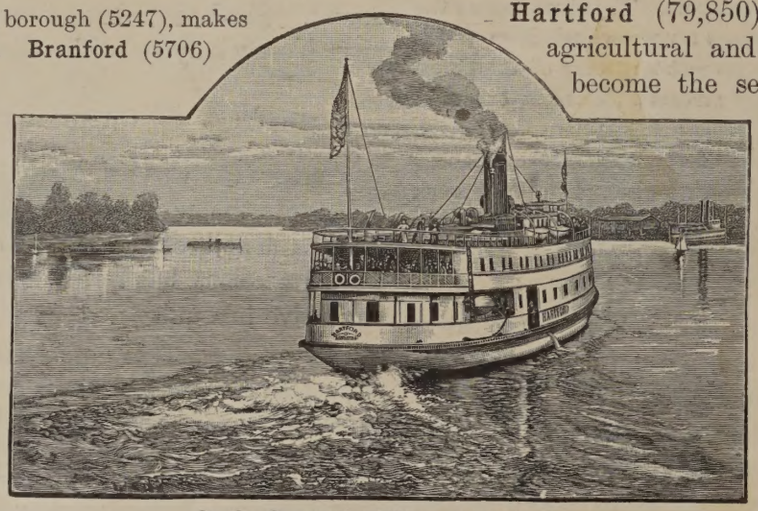
New Haven was formerly one of the two capitals of the state, and is the seat of Yale University.

The principal products of New Haven are ammunition, firearms, rubber goods, cutlery and many kinds of hardware, carriages, clocks, corsets, starch. Fair Haven, a part of New Haven, has a large oyster business.

Orange, including **West Haven** borough (5247), makes pianos, buckles and cement pipe. **Branford** (5706) makes locks and malleable iron.

Bridgeport (70,996), having business connection with a number of towns in the inner valleys and being not distant from New York, has grown to be one of the most important cities in the state.

Its products are chiefly sewing machines, corsets, hardware, machinery, ammunition and brass, rubber and silk goods. Fisheries are carried on from its harbor.



On the Connecticut River at Hartford.

The town of **Norwalk** (19,932) claims the distinction of containing two cities, **Norwalk** (6125) and **South Norwalk** (6591). The latter has a large trade in oysters.

The town manufactures air and gas compressors, corsets, fur hats, hardware, shoes, paper, felt and woolen goods.

The towns of **Stamford** (18,839; city, 15,997), **Greenwich** (12,172), **Stratford** (3657) and several smaller towns on the sound in the southwest of the state are the homes of many New York business men, especially in summer.

Stamford's chief manufacture is hardware, including special patterns of locks and keys. It makes machinery, dyes and shirts. Greenwich makes belting, woolens and hardware.

New London (17,548), lying on an excellent harbor near the eastern end of the sound, has a United States navy yard. Early in the present century, many whaling vessels were fitted out here. At present a number of sealing vessels in Bering sea hail from this port; but the chief business of the city is manufacturing.

The principal products of New London are silk and woolen goods, cotton gins, machinery, umbrellas, crackers. It is interested in local fisheries, and is the port of a steamboat and railroad line between New York, Boston and Worcester. Opposite, at Eastern Point, Groton, steel ships are built.

Norwich (17,251), at the junction of the Yantic and Shetucket, and at the head of the tidal estuary of the Thames, has an admirable combination of water power and harborage. It is a center of trade for the southeastern part of the state.

Cotton goods form the chief industry. Paper, and many iron and steel goods, like firearms, machinery, printing presses, are also made. There are also cotton mills at **Jewett City** (2224) in the town of **Griswold.**

The excellent harbor of **Stonington** (8540) has for many years been used by steamboats from New York, that connect here with cars for Providence and Boston.

Stonington makes cotton, silk and woolen goods, printing presses and fertilizers, and builds ships.

Montville (2395) produces paper and cotton and woolen goods.

Hartford (79,850), in the midst of a rich agricultural and manufacturing district, has become the second city of the state. Its growth is largely due to its being the state capital, and lying farthest inland of any city in Connecticut that has good water communication.

Hartford is largely engaged in banking and insurance. Its great variety of manufactures includes fine tools, bicycles, machinery, rubber and silk goods, carriages, firearms, envelopes. This city is the seat of Trinity College.

Middletown (city, 9589), the seat of Wesleyan University, lies on the Connecticut near the point where it leaves the fertile lowland for the narrow lower valley. Middletown, like Hartford, has the advantage of tide water.

The principal products of Middletown are cotton, silk and woolen goods, rubber goods and plated ware.

Portland (3856) and **Cromwell** (2031) have extensive sandstone quarries, and ship large quantities of this excellent building stone by the river.

First Watch Factory in America, at Waterbury.

New Britain (25,998) is famous for its great factory of builders' hardware; and **Meriden** (24,296) is the leading

city of the United States in the manufacture of plated and britannia ware. The leading industrial position of these cities is not so much the result of any remarkable natural advantages, as of the enterprise of their citizens.

They produce, also, other hardware, cutlery, tools, lamps, organs, knit and woolen goods and house furnishing goods.

Wallingford (9001) is a manufacturing center in the southern part of the great valley lowland.

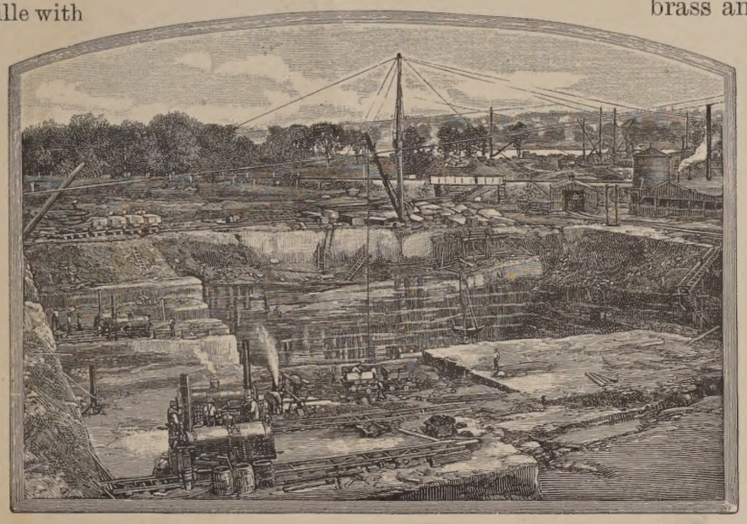
This town produces silver, plated and britannia ware, brass and rubber goods.

South Manchester (Manchester, 10,601) is the seat of extensive silk factories. It is noted for the interest shown by the mill owners in the welfare of the operatives. Cotton and woolen goods and paper are also made here.

Enfield (6699) includes Hazardville with its gunpowder factories and Thompsonville with its large carpet works.

Windsor (3614), **East Windsor** (3158) and **Windsor Locks** (3062) produce silk and woolen goods, paper and machinery.

Wethersfield (2637), **Glastonbury** (4260), **Farmington** (3331) and other places on the valley lowland are chiefly devoted to agriculture. Tobacco is an important crop. Garden seeds are here raised in great quantities, and extensive peach orchards have been planted. Many metal wares are produced.



Sandstone Quarry, Cromwell, Connecticut.

Southington (5890) makes hardware and cutlery. **Berlin** (3448) makes iron and steel frames for buildings and bridges, also brick and tile.

Waterbury (45,859), the largest city within the western upland, is noted for its extensive brass manufactures and for the large number of inventions made by its mechanics.

Among the products of the city are tubes, wire, lamps, buttons, needles and pins. About 30,000 clocks and watches are here made in a day.

Watertown (3100) makes silk goods, mouse traps and hardware.

Bristol (9643) and **Winsted,** a borough in the town of **Winchester** (7763), are important manufacturing centers. Both are famous for clock making. They also produce bells, hardware, knit goods and a variety of small articles.

Thomaston (3300) manufactures clocks, brassware, cutlery, edge tools.

Torrington (12,453), on the Naugatuck, is the leading town of Litchfield county in population and manufactures. Its prominence is largely due to its brass and copper industries.

Nickel, silver- and gold-plated goods are also made, and needles, nails, machines and furniture.

Litchfield (3214) is a favorite summer resort in a farming community. **Norfolk** (1614) is the highest town in the state.

Naugatuck (10,541) is one of the principal seats of the rubber goods industry. It also produces knit underwear, malleable iron and buttons.

Seymour (3541) manufactures worsted goods, edge tools and hardware.

Ansonia (12,681) is one of the leading manufacturing places on the Naugatuck. Its products consist largely of brass and copper.

Clocks, pins, lamps, iron castings and brass and copper wire are made.

The city of **Derby** (7930) and **Shelton,** a borough in the town of **Huntington** (5572), are close together at the head of tide on the Housatonic.

They produce brass goods, pianos, plated ware, guns, woolen and cotton goods and small wares.

Danbury (16,537) has the largest hat factories in the country, producing about 3,000,000 hats a year. **Bethel** (3327) shares in this industry.

In **New Milford** (4804) tobacco is the principal product. Hats, furniture and lime are made.

The eastern upland contains no large manufacturing cities, but a number of busy cities and towns may be found in its valleys, such as **Willimantic** (8937), **Rockville** (7287) and **Putnam** (6667).

Willimantic is famous for its thread. It also produces silk and cotton goods and fine machinery. Rockville is a noted center for woolen and worsted goods. Sewing silk, envelopes and paper are made here. Putnam makes cotton and woolen goods, spool silk, thread, shoes. **Thompson** (6442) makes cotton and woolen goods. **Stafford** (4297) has woolen mills, **Danielson** in the town of **Killingly** (6835) makes the same textiles, also hosiery and harness. **Plainfield** (4821) makes textiles and wooden goods.

Many other busy towns and villages are dotted over the state wherever the soil can be tilled or water power be found.

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